Medical Library

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The ILLINOIS Medical Journal

VOL. 82 NO. 4

October, 1942

In This Issue

Surgery of the Biliary Tract

Improved Methods in the Diagnosis and Treatment of Protozoan Infections of the Intestine

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OFFICIAL JOURNAL OF THE ILLINOIS STATE MEDICAL SOCIETY

Announcing

a supplemental aluminum therapy

*Phosphaljel**

WYETH'S ALUMINUM PHOSPHATE GEL

Aluminum hydroxide gel is accepted therapy in the management of peptic ulcer . . . Its impressive record of effectiveness suggested the development of an alternate aluminum preparation to meet particular requirements in certain cases.†

Phosphaljel, Wyeth's Aluminum Phosphate Gel, was originated by Wyeth and was used experimentally in the first successful attempt to prevent postoperative jejunal ulcer in Mann-Williamson dogs. Some animals were allowed to develop Mann-Williamson ulcers and the effectiveness of Phosphaljel was further demonstrated when its administration was followed by prompt healing of these lesions in every case.[1]

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Phosphaljel contains 4% aluminum phosphate and possesses antacid, astringent and demulcent properties analogous to those of aluminum hydroxide gel.

[1]*Fauley, G. B.; Freeman, S.; Ivy, A. C.; Atkinson, A. J., and Wigodsky, H. S.: Aluminum Phosphate in the Therapy of Peptic Ulcer, Arch. Int. Med. 67: 563-578 (March) 1941.*

PHOSPHALJEL

Wyeth's Aluminum Phosphate Gel

* Reg. U. S. Pat. Off.

JOHN WYETH & BROTHER, INCORPORATED, PHILADELPHIA

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The Illinois Medical Journal

October, 1942
VOL. 82, NO. 4

Official Journal of the Illinois State Medical Society

EDITOR — Harold M. Camp. EDITORIAL BOARD — James H. Hutton, Chairman, Frederick H. Falls, Josiah J. Moore, Edwin M. Miller, Chauncey C. Maher, Harry S. Gradle, Philip H. Kreuscher, Harry Culver.

Editorials

"WHEN A LITTLE KNOWLEDGE IS A DANGEROUS THING"

During recent years many popular magazines have featured articles written by non-medical people on medical subjects which frequently are an elaboration of preliminary reports by physicians who have been doing experimental work on the particular subject. In the majority of instances no actual claims have been made by the members of the medical profession regarding the merits of the treatment under discussion.

September Reader's Digest published an article by Mr. Paul de Kruif entitled: "Found — A One Day Cure for Syphilis" in which the writer states that "now there actually is promise of a one day cure." In the article the reader is led to believe that the standard methods requiring a minimum period of 18 months are too painful, too dangerous and require too much time to satisfy the average individual having the disease. Reference was made to experimental work with fever therapy in early syphilis in which cases were treated with the induction of fever to 106 degrees for a period of ten hours. Reference was made to the dangers of arsenical therapy, this no doubt based on articles published some ten years ago. Physicians know that with the present day treatment with modern, standardized preparations of arsenicals and the heavy metals, the reactions are now rarely seen.

In a recent article by Lehmann* the treatment of syphilis in the U. S. Army is outlined as handled by the urologic service. All patients in the early infective stage are hospitalized until the condition becomes non-infectious. "Treatment for early syphilis is standardized so that the optimum requires continuous treatment with alternating courses of thirty each of arsphenamine and bismuth injections for one year, with clearance only after the serologic reactions of blood and spinal fluid have become and remain negative for a year. On completion of the optimum treatment the patient is followed up at frequent intervals."

Lehmann states: "the technic of massive dose arsenotherapy of early syphilis by the intravenous drip method has not been adopted by the Army." The Army, therefore, has not adopted the so-called "five day" or "ten day" treatment by the continuous intravenous drip method, which has been used rather extensively in hospitals and clinics and is still considered as being in the experimental stage.

The article in Reader's Digest will no doubt cause much embarrassment to many physicians whose patients have been required to take the generally approved forms of treatment, and no doubt some of them will develop the idea that their physician is not entirely up to date and they may seek further advice from a "modern" up to the minute physician willing to use the "new" method promising a one day cure.

Some months ago another article appeared in Reader's Digest assuring quick relief to sufferers

*"Dermatology in the Army" by C. F. Lehmann, M.D., Lt. Col. U. S. A., Journal, A. M. A., August 29, 1942.

of "athlete's foot" through the application of a 50% mixture of phenol and camphor. Recent issues of medical journals have reported cases of dermatitis venenata resulting from the use of this mixture and many pharmacists have reported that individuals who read the article have requested them to sell the mixture so highly recommended.

Reader's Digest is undoubtedly one of the most popular of the many modern magazines and it will be found no doubt, in the waiting room of many physicians. It is possible that patients awaiting the regular treatments for syphilis may read the article written by Mr. de Kruif while waiting for their turn to see their physician. In such instances more time of the busy physician must be consumed giving the proper explanation to his patient.

The principal criticism which seems desirable is that such magazines as Reader's Digest should either have a medical editor to review all material submitted on medical subjects, or should have a provision whereby all articles of this type which are reprinted would be referred to a capable physician for a critical evaluation such as is given today to the many articles submitted to medical journals for publication.

THE SCRAP CAMPAIGN

Everyone knows that America is at war, and that this is an all-out affair. We need not only man power, but must have the materials from which war materials are made in sufficient quantity to rout the enemy. American industries have undertaken this big job, but they must have not only the available supply of crude ore, but also the millions of tons of waste scrap to be found throughout the country.

Steel to go into planes' tanks, guns and ships to win the war can be made in large quantity if the American people will all get back of this scrap campaign, and turn in all available metal to be found in or around their homes. Likewise much scrap is still available if looked for, in

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the form of old or unused rubber, twine, tin, bronze, burlap and other critical materials so essential at this time.

Every community should organize a scrap campaign, beginning with an educational program and further the effort to find the supplies in the home, workshop, on the farm, and elsewhere. Many old factories have much metal which can be salvaged. Plants partly or completely destroyed by fire are frequently the source of much salvage material, old pipes, castings, and machinery, which can never be used otherwise.

Places should be made available in every community where these bits of scrap material can be taken, and in cases where larger amounts of scrap are available, trucks should be at the disposal of those responsible for the campaign, which can go to the various places and get this valuable material.

Throughout the country, in parks, around court houses, and elsewhere there are thousands of old cannons of earlier wars, which can be utilized to good advantage in this campaign. Many tons of old iron fence, which can be easily replaced by a more modern type, should be made available. Street car tracks and interurban lines, which have been abandoned, can be torn up and utilized in the manufacturing of modern machines of war.

The American Industries Salvage Committee has recently released 10 suggestions for getting out industrial scrap which should be given wide publicity.

1. Head up the campaign by appointing an able executive of the company armed with authority to act.

2. Use posters, illustrations, pay envelope stuffers, and all other means to enlist all employees in scrap campaigns.

3. Comb plant and yards for dormant scrap and usable and abandoned equipment.

4. Survey all plant equipment, particularly idle, standing or discarded machines.

5. Classify and segregate scrap and supervise its handling.

6. Make each foreman responsible for preventing spoilage and waste in his department.

7. Report promptly equipment which is obsolete. If equipment has not been used in three months, and it can't be proved that it will be used in the next three, turn it over where it can be used or scrap it.

8. Salvage usable parts from equipment marked for scrapping.

9. Speed return of scrap to mills and refineries through existing channels. Report regularly on collections of scrap to the Industrial Salvage Committee set up by the War Production Board in your community.

10. Enforce monthly re-checks in every department to find scrap materials previously overlooked.

These suggestions may well be considered by the households of America to good advantage, for it is quite apparent that the surface has not yet been even scratched, when it comes to utilizing the actually available scrap material which is dormant throughout the country.

Physicians' offices and homes are likewise good sources for much scrap material, old lighting fixtures, pipes, burned out grates, or fire boxes from furnaces, and even the stock of old and useless keys, which can be found in every home will be of material aid in this first national salvage campaign.

NO CERTIFICATION OF PROSTITUTES

At the meeting on June 9th, 1942 at Atlantic City, the House of Delegates of the American Medical Association passed a resolution which will greatly aid in the fight against venereal diseases by placing the medical profession on record against the medical inspection and certification of prostitutes. The resolution was introduced by Doctor George Kosmak, a leading physician of New York City, well-known to the profession as the editor of the American Journal of Obstetrics and Gynecology. The Reference Committee to which the resolution was referred reported it favorably to the House of Delegates with the following statement:

"Your reference committee is completely in accord with the provisions of this resolution and recommends its adoption. It is inconceivable that any reputable physician should so degrade his profession and himself as to issue certificates to prostitutes, to the effect that they are free from venereal disease. This is a baneful practice which encourages the maintenance of vice and may do incalculable damage by giving false as-

surance of safety and lead to an appreciable increase in venereal disease. Moreover, it tends to nullify the efforts of the duly constituted authorities, Federal, State and local, to deal with the problems of prostitution by law enforcement and other accepted methods.

"Your reference committee wishes only that it were gifted with the power of expression to emphasize more strongly its approval of the spirit and intent of the provisions of this resolution."

It will be noted that the American Medical Association declares that "physicians who knowingly examine prostitutes to give them medical certificates to be used in soliciting were participating in an illegal activity and violating the principles of accepted professional ethics."

Unfortunately, the type of physician who makes a practice of examining and certifying prostitutes is unlikely to be restrained, by ethical considerations, from aiding the prostitution racket by issuing certificates of one sort or another to help prostitutes lure customers. For the restraint of these unethical doctors laws similar to those of New Jersey and Oregon, should be on the statute books of every state now lacking such provisions. Such laws prevent flagrant practices such as the issuance of certificates over a doctor's signature stating that an individual has been examined by the signator on such and such a date and was found free from "venereal disease" or from "any infectious diseases." Such certificates formerly were common and they were sometimes issued by quack doctors without the formality of any examination whatever.

Nowadays this same type of doctor, sometimes guided by an equally unscrupulous lawyer, avoids the legal obstacle by giving prostitutes whom he may or may not examine a card or slip of paper stating that their blood was tested for syphilis on such and such a date and found "negative." Prostitutes assure prospective patrons that this means certain freedom from venereal disease — and the popular over-emphasis on the alleged infallibility of the blood test for syphilis often leads to acceptance of a negative serological report as a guarantee of freedom from syphilis and maybe gonorrhea as well.

Prostitutes are quick to take advantage of anything which they may use to indicate that they are healthy. They often call themselves waitresses and so obtain food handlers' health cards. They use venereal disease clinic registration cards to support a claim that they are examined regularly by health department doctors. A prostitute-inmate of a brothel, in a city near which a great camp is situated, showed an investigator how she convinces skeptics who fear infection. She offered what she claimed was a "health card" as proof of freedom from venereal disease. The card she had in her possession apparently was a treatment record which had been issued by the local health department. It bore the rubber stamped signature of the city health officer, and in chronological order listed the bismuth treatments she had received to date. These she palmed off on customers as "shots" of a serum used to immunize one against syphilis. Rather cleverly she stated: "Just like boys in the Army are innoculated against smallpox... this stuff is given to us to prevent syphilis. . . ."

In recent years local authorities in many cities have compelled prostitutes to be photographed and fingerprinted and examined periodically for venereal disease. In some communities the authorities insisted that the prostitute visit certain physicians; in others the girls were permitted to choose their own doctors. In either case the police required prostitutes to have "health certificates." Thus in a large measure the authorities created a condition which led some ethical as well as many unethical practitioners to issue venereal disease certificates. With the better enforcement of state laws and local ordinances especially since the declaration of war, these practices have greatly diminished.

It is suggested that each state should by law prohibit the issuance by physicians, health officers, or by anyone else, of certificates of freedom from venereal disease to any prostitute or to anyone for the purposes of prostitution; that physicians, health officers and clinic directors should take precautions to prevent prostitutes or others engaged in the prostitution racket from gaining possession of and making use of cards, reports or records for purposes of prostitution. This subject is considered worthy of the attention of medical societies, especially at present when prostitution and venereal diseases are serious problems for the armed forces and for war industries.

Correspondence

CONFERENCE ON VENEREAL DISEASE

The Conference on Venereal Disease Control Needs in Wartime will be held at the Arlington Hotel, Hot Springs National Park, Arkansas, October 21-24, 1942 under the auspices of the U. S. Public Health Service in conjunction with the Eighth Annual Meeting of the American Neisserian Medical Society. The tentative program follows.

October 22, 10 A.M. — Session I

Veneral Disease Control Measures Influencing the War Effort

Welcome Address — Surgeon General Thomas Parran

1. Rehabilitation of Selectees with Syphilis and Gonorrhea — Lt. Col. Richard H. Eanes, Asst. Dir., Medical Division, Selective Service System
2. Present Venereal Disease and Prostitution Problems as They Relate to the Army — Lt. Col. T. B. Turner, Director, Venereal Disease Control Division, Preventive Medicine Service, United States Army
3. Present Venereal Disease and Prostitution Problems as They Relate to the Navy — Captain C. S. Stephenson, In Charge, Division of Preventive Medicine, Bureau of Medicine and Surgery, United States Navy
4. The Contribution to the War Effort of the Subcommittee on Venereal Diseases, National Research Council — Dr. J. E. Moore, Baltimore, Md.
5. Private Physician Support of the Wartime Venereal Disease Control Program

October 22, 2 P. M. — Session II

The Epidemiology of Syphilis and Gonorrhea — 1942

1. The Epidemiology of Gonorrhea as a Stimulus to Prostitution Repression — Dr. Donald H. Williams, Medical Director, Division of Venereal Disease Control, Provincial Board of Health, Vancouver, B. C.
2. Improvement of Present Methods for Extra Familial Contact Tracing — Miss Mary A. Burke, Consultant in Social Hygiene Nursing, Detroit Department of Health
3. Difficulties in Case Holding of Selectees Infected with Syphilis — Dr. G. Foard McGinnes, Director, Division of Venereal Disease Control, Tennessee State Department of Health
4. Defects in the Present Follow-up Program — Lida J. Usilton, Principal Statistician, Division of Venereal Diseases, U. S. Public Health Service
5. The Male Investigator in Venereal Disease Control Follow-up — Dr. Malcolm H. Merrill, Chief, Bureau of Venereal Diseases, California Department of Public Health

October 23, 9:30 A. M. — Session III

Eighth Annual Meeting, American Neisserian Medical Society

1. The Control of Venereal Disease Among Industrial Workers — Surgeon Otis L. Anderson, Assistant Chief, Division of Venereal Diseases, U. S. Public Health Service
2. Organization and Management of Clinics in a State Gonorrhea Control Program — Dr. F. W. Caudill and Dr. R. E. Teague, Kentucky State Department of Health
3. Gonococcal Culture Methods — Dr. Charles M. Carpenter, School of Medicine, University of Rochester
4. Management of Gonorrhea in the Male — Dr. P. S. Pelouze, University of Pennsylvania, Philadelphia
5. Management of Gonorrhea in the Female — Dr. Robert M. Lewis, Yale University School of Medicine
6. Hyperpyrexia in Chemoresistant Gonorrhea — Dr. Stafford L. Warren, School of Medicine, University of Rochester

General discussion of the above panel led by Dr. Nels A. Nelson, Director, Division of Venereal Disease Control, Maryland Dept. of Health, and Dr. Adolph Jacoby, New York City Health Department

October 23, 2:00 P. M. — Session IV

Eighth Annual Meeting, American Neisserian Medical Society

1. Gonococcus Cultures as a Public Health Service — A Preliminary Report — Captain Daniel Bergsma, Venereal Disease Control Officer, Headquarters, First Army, Governor's Island, N. Y.
2. President's Address — Assistant Surgeon General R. A. Vonderlehr, Division of Venereal Diseases, U. S. Public Health Service
3. Gonorrhea from the Standpoint of the Army — Captain Ernest B. Howard, Venereal Disease Control Officer, Fourth Army Corps Area, Atlanta, Ga.
4. Gonorrhea from the Standpoint of the Navy — Captain C. S. Stephenson, In Charge, Division of Preventive Medicine, Bureau of Medicine and Surgery, United States Navy
5. Resumé of the Year's Research in Gonorrhea — Dr. Alfred Cohn, Department of Health, New York City
6. The Role of Organized Medicine in the Control of Gonorrhea — Dr. Robert S. Breakey, Lansing, Michigan

October 23, 2:00 P. M. — Demonstration

Technics of Modern Serodiagnostic Tests for Syphilis

October 24, 9:30 A. M. — Session V

Wartime Venereal Disease Control Education Program

1. The Relationship between the Programs of Venereal Disease Control Education and the Repression of Prostitution
   a. From the point of view of public health — Dr. George M. Leiby, Director, Division of Preventive Medicine, Louisiana State Department of Health
   b. From the point of view of social protection — Mr. Charles P. Taft, Assistant Director, Office of Defense Health and Welfare Services
   c. From the point of view of the public — Mr. Capus Waynick, Director, Demonstration of Public Health Education Measures in the Control of Venereal Diseases, Raleigh, N. C.
2. The Venereal Disease Control Education Program in the Armed Forces
   a. Army — Major William A. Brumfield, Venereal Disease Control Division, Preventive Medicine Service, U. S. Army
   b. Navy — Captain C. S. Stephenson, In Charge, Division of Preventive Medicine, Bureau of Medicine and Surgery, U. S. Navy
3. The Current Status of Venereal Disease Education — Surgeon General Thomas Parran, U. S. Public Health Service

October 24, 2 P. M. — Session VI

Research Influencing the Wartime Venereal Disease Control Program

1. Progress in Investigations of the Intensive Therapy of Syphilis — P. A. Surgeon Harry Eagle, U. S. Public Health Service Syphilis Research Center, Baltimore, Md.
2. New Serologic Tests for Syphilis and Their Demonstrated Efficiency — Dr. Arthur H. Sanford, Mayo Clinic, Rochester, Minn.
3. Progress in the Wartime Management of Gonorrhea — Dr. P. S. Pelouze, University of Pennsylvania, Philadelphia
4. Relationship between Venereal Disease Control and the Joint Army and Navy Committee on Welfare and Recreation — Brigadier General F. H. Osborn, Chief of Special Service, United States Army
5. Problems Involved in the Adaptation of Recent Scientific Discoveries to the Wartime Control of the Venereal Diseases — Dr. John H. Stakes, University of Pennsylvania, Philadelphia

October 21, 2 P. M.

Technics of Venereal Disease Education

1. Introductory comments — Assistant Surgeon General R. A. Vonderlehr, Division of Venereal Diseases, U. S. Public Health Service
2. Presentation of a Typical Venereal Disease Education Problem for Discussion by Panel and Conference

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GREETINGS AUXILIARY MEMBERS — FROM YOUR PRESIDENT —

Vacations are over and our activities are waiting; let us think seriously of our auxiliary work.

With this thought in mind, may I extend to you assurance of most hearty cooperation throughout the coming year. I trust we will keep well informed by reading and studying the aims and objectives of our Auxiliary, read the Auxiliary Bulletin, Illinois State Journal, and the American Medical Journal.

Convention Pledge We pledged our Auxiliary to assist Dr. E. H. Weld, President of the Illinois State Medical Society, and a pledge to cooperated with the sale of Defense Stamps and Bonds. I urge every county to share in these activities. The sale of Bonds and Stamps typifies the good will of all organizations and the people of our Country. We are to help and never fail our men who are risking all they hold dear.

Membership The increase of membership in our Auxiliary is the responsibility of every member in the Auxiliary. This cooperation will

build up our State figures. If we, the members of this Auxiliary, will keep abreast as to the aims and objectives, we will prove that we are the strongest ally to medicine. Why? Because we are alert to the welfare of our doctors and the Auxiliary.

Benevolence Fund Benevolence work is another objective of the Auxiliary. As members and wives of physicians, this should be one of our first contributions of the year and we ask the wives of all physicians to share in this, our great work. Years pass on, and time with memories is all that is left for those who never said, nay. May we add comfort and joy in the closing of their years.

Extra Activities Red Cross, First Aid, Nurse's Aid, and Nutrition Programs all come under the national emergency. Do not fail to cooperate at all times. Remember the boys who are in the camps near your County — help to keep them happy; they, who have but one thought, to keep our Flag flying and our Country safe for democracy.

May I announce at this time, all our Officers and Chairmen have ready the year's plans and will be happy to serve you.

I, too, pledge my promptness,

Sincerely yours,

HILDA B. WANNINGER, President,
Woman's Auxiliary to the
Illinois State Medical Society

THE BULLETIN

It is the plan of the National Board to use the OFFICIAL PUBLICATION to present important material to the members of the Woman's Auxiliary to the Medical Society.

All issues of the BULLETIN will contain programs and information which will aid in the promotion of Auxiliary projects. I urge each member to subscribe to this publication so that she may be well informed of the activities throughout the country.

Yearly subscription $1.00.

State Bulletin Chairman,
Mrs. John Soukup,
10754 Lafayette Ave.,
Chicago, Illinois.

Mrs. W. J. Wanninger,
President.

PUBLIC RELATIONS PROGRAM

The following program has been recommended for the States use. We hope you will be able to do as much of the plan presented as will apply to your County, and your local needs.

(1) Promotion of health education among lay groups by disseminating accurate health data through speakers from Medical groups and the Illinois State Medical Speakers Bureau, also health exhibits and the distribution of health literature in meeting places.

(2) Familiarize members of the Auxiliaries and through them lay groups with the achievements of American Medicine, past and present.

(3) Cooperate and give practical help to child and maternal health care or any plans pertaining to the advancement of child health.

(4) Promotion of nutrition programs, presenting authentic information. Auxiliary members can and should assume leadership in this field, for the increased interest of the public in demanding a program that is free from fads and fancies and is accurate, gives Auxiliaries a rare opportunity.

(5) Cooperate in all forms of National Defense.

(6) Promotion of nurses aids groups on National scale Auxiliaries.

(7) Practical assistance to the families of the physicians in army corps.

(8) Interest in Pan American Medical Unity.

Your responsibility for a perfect "Public Relations Day" will be to extend a welcome to all lay organizations, Presidents and health chairmen who look to the dvancement of health education, it is the duty of all members to cooperate and have a successful "Public Relations Day."

All Public Relation work must be approved by your County President and advisory committee.

Please feel free to ask for further information.

Sincerely yours,
(Mrs. V. M.) Blanche M. Seron
State Public Relations Chairman

Medical Economics

Edited by R. K. Packard, M.D., Chairman of the Committee on Medical Economics of the Illinois State Medical Society, 826 East 61st Street, Chicago, Illinois.

We are in the midst of rationing various essentials necessary to an all out war program and to the maintenance of civilian requirements. To say that rationing is in somewhat of a mess would probably be a frank and mild statement.

The medical profession is essentially interested in the rationing of doctors for the care of our armed forces and the maintenance of our civilian health. It appears that Procurement and Assignment is making some progress but there are many problems yet confronting them, particularly regarding the problem of essentials. Under the present set-up and from various statements made, the army will require about 58,000 doctors for an army of 10,000,000 men. This figures out roughly one doctor to about every 173 men in the army. It is estimated that there were 145,000 doctors engaged in the practice of medicine at the outset of the war. This would leave a balance of 87,000 doctors to care for approximately 120,000,000 people on the home front or approximately one doctor for every 1,379 people. The question arises as to whether this rationing is well founded — speaking from my own experience in World War I it would seem to me, without any question, that the number of physicians in the unit I was attached to was far in excess of the needs. There were a number of physicians in that unit who did very little work during the period they were attached to the unit. To say it quite bluntly, there were about one-third of the physicians who did practically all of the work. There were a number who did practically nothing as far as rendering service to the army. This, of course, was not their fault but rather the fault of the Commanding Officer and the higher ups in charge of medical service. In the past few months, I have taken the time to talk with a number of physicians, who were in World War I relative to this matter, and their opinion coincides fairly well with mine.

At the present time in the United States there is one physician for about every 880 people, and as a whole I do not believe that doctors are over worked. Necessarily they divide into various groups, those having more than they should do, those who do a fair amount of work, and a large number with plenty of time to spare.

Procurement and Assignment has attempted to place men where they are best qualified to work, and I think in this particular work they are to be commended for actually accomplishing something that was not accomplished in World War I.

It would seem obvious that with most of these physicians being well trained and accustomed to handling a large practice that they will render a better and more efficient service than was rendered in World War I, and that this can be accomplished with a ratio of doctors to the army of less than the present quoto. The older men in the profession and perhaps a certain number that are less well trained and less adapted to the care of a large number of patients are left with the care of the entire civilian population. Of the older men who are better trained and already accustomed to caring for a large practice will have the largest number of additional patients because they are already leaders in their community. The problem is how long will they be able to maintain the high pressure that will be set for them in taking care of the civilian population.

I would not attempt to say what number of physicians should be required for an army of 10,000,000 — obviously the army heads are in a much better position for that, and I assume that it is determined on the basis of previous wars and the present war. I think we are all agreed that there is considerable bungling in the war in all of the various departments, that make up a vast program, and that it takes a considerable period of time to reach any fair degree of efficiency in a hastily prepared war program and in a hastily developed army. It is possible that such might be the case in the medical department.

Again, reverting to doctors who saw active service in World War I. It is generally reported by them that they did not work nearly as hard as they did in private practice. Obviously there are marked exceptions to this rule depending on the type of work they were engaged in and the location of their particular unit. Many units were over worked and under went many hardships but generally speaking this was probably far from the rule.

In the final analysis the rationing of doctors is not unlike the rationing of other necessities for war efficiency and production. The best example of sound judgment is that of Mr. Jeffers, newly appointed head of Rubber Conservation, who stated that while we must conserve the produced rubber for the armed forces we must not lose sight of the necessity of keeping the cars of the United States rolling on rubber both for the transportation of necessities of war purposes and civilian purposes but also for the transportation of workers to various production plants. In other words, the army can accomplish very little unless we can produce the things that the army needs for the prosecution of the war, and therefore rationing must not be allowed to be too lopsided.

The rationing of labor also presents a problem between the production of our agricultural necessities and the production in our factories of the various war products. It is obvious that the farmers cannot compete in wages with the factories under the present system. Labor has placed great emphasis on their patriotism and loyality to the government in the part they have played in turning out our war material, and yet if one follows closely the program of labor it is quite evident that in a large number of instances their contribution has meant no particular sacrifice but rather an increase in wages with little or no inconvenience to themselves. They have made the just claim that the increase cost of living entitled them to an increase in wages, and yet there seems to be sufficient proof that their pay and their time and a half has more than off set their increase cost of living.

At the present time we have a great controversy over ceiling for farm products and ceilings for labor wages, and that these ceilings must be established if we are to prevent inflation. At this time there appears to be little in common between the agriculturals interest and the labor interest as to the solution of this problem. We cannot deny the fact that there are problems that are difficult to settle and that eventually the government has to use a firm hand in the establishment of these ceilings and in the rationing of labor between agricultural and industry for the proper prosecution of our war efforts. It is the general feeling that there is a definite effort to delay final action in many of these matters until after the fall election despite the President's statement that unless the congress established a farm ceiling by October first that he would do it himself. Perhaps if he had also asked congress to establish a ceiling on wages by that date they would have been a more general approval of his statement because it is obvious that one cannot be accomplished without the other. While it is true that he stated that after congress had established the farm ceiling he would establish a labor wage ceiling — it left considerable doubt as to what that ceiling would be, and naturally a controversy must arise because the ceilings should be established at one and the same time.

It is now estimated that we have 2½ million people on the federal payroll with innumerable bureaus that are not at all correlated at the present time. We are largely interested in the war effort and again the problem of rationing is in evidence as evidenced by the fact that we have one federal employee for every four soldiers if we mass an army of 10,000,000 men. If the need for man power is what we are led to believe it is at the present time, in the actual prosecution of the war, it might not be out of place to consider the re-rationing of federal employees

so that they might be placed where they will actually make some definite contribution to the war program instead of a liability in the form of increased taxation to support them, and somewhat disgruntle public at their inactivity in a real emergency.

R. K. Packard, M.D., Chairman
Committee on Medical Economics.

1943 ANNUAL A. M. A. SESSION CANCELED

"The American Medical Association will not hold its ninety-fourth annual session, scheduled to convene in San Francisco in 1943," *The Journal* of the Association announces in its September 26 issue. The editorial on the action by the Association's Board of Trustees explains that: "This is the third time in the history of the Association that an annual session has been canceled. In 1861 the session was postponed for a year because of the outbreak of the war between the states, and in 1862 it was again postponed for a year because of the demands of the war on the medical profession. The House of Delegates, the Board of Trustees, the scientific councils and the officials of the Association will be called into session to deal with the affairs of the Association, particularly the many wartime responsibilities being borne by the medical profession.

"The tremendous demands on the medical profession of the United States in association with the war, including the provision of physicians for the armed forces, for the care of veterans, for industry and for the care of the civilian population, has caused the Board of Trustees of the American Medical Association to give special consideration to problems associated with the holding of the session.

"The annual session of the Association with the attendance usually assembled on such occasions would take away from medical practice at the time from six to ten thousand doctors, together with many persons in associated professions concerned with the Scientific Exhibit, the Technical Exhibit and other features. The demands on the time of physicians are already innumerable. Moreover, the holding of the session in San Francisco would involve transportation in large part from other sections of the country, calling particularly on the railroads and also on all other means of transportation.

"The Board of Trustees has given special attention to statements issued by the Office of Defense Transportation, the War Department, the Navy Department and other governmental agencies concerning the holding of conventions.

"The primary consideration involved particularly relating to the annual session is the call that would be made on the time and work of physicians. Already the utmost that the medical profession can do to provide medical services for the Selective Service System, the Army, the Navy, the Public Health Service, industry and the civilian population is in some places being severely strained. These demands will no doubt be intensified by next June.

"While the Scientific Assembly and the Scientific and Technical exhibits will not be held in 1943, the many significant problems of the medical profession occasioned by the war, particularly such as concern the provision and distribution of physicians and the provision of medical service, are of such moment that the House of Delegates, the Board of Trustees, the various scientific councils and officials will be called into session in June 1943. This meeting will be held in Chicago in order to place the minimum stress on the time of the physicians concerned and on the transportation facilities of the nation.

"In making these decisions the Board of Trustees has kept in mind the solemn obligation entered into by the House of Delegates and the Board of Trustees of the American Medical Association to give to the nation every possible contribution that the Association can make to aid the war effort."

I am glad I have the four attributes for longevity: low blood pressure, low basal metabolism, low pulse rate — and a low sense of humor!

"What this country needs," said our postoperative patient, after reviewing the bill, "is a good five cent scar!"

"Violent exercise after forty," says *Dr. M. O. Rouse* of Dallas, "is especially harmful if you do it with a knife and fork!"

Medicine's Role in the War Effort

DR. SEELEY TRANSFERRED FROM PROCUREMENT AND ASSIGNMENT SERVICE

The Directing Board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians has formally expressed its appreciation of the services rendered by Col. Sam F. Seeley, who has been transferred to military duty. Following is the text of the resolution adopted:

The transfer of Lieut. Col. Sam F. Seeley from his connection with the Procurement and Assignment Service to active military duty causes a great loss. Colonel Seeley, who has acted as executive officer since the beginning of this service, has been transferred to military duty, which is in keeping with the policy recently adopted by the War Department. His training and experience with the Medical Corps of the Army in his professional capacity amply justifies such a step.

The Directing Board of the Procurement and Assignment Service wishes to take this opportunity of expressing to the Surgeon General of the United States Army its very deep appreciation for the valuable service which Colonel Seeley has rendered during its period of organization and functions.

The Directing Board expresses to Colonel Seeley its deep appreciation for the great sacrifice which he has made in dislocating himself from actual military duty to serve with us in an executive capacity. He has been most unselfish and has given unstintingly of his time, energy and patience in helping to solve many of the problems connected with the functioning of the Procurement and Assignment Service. He has not only labored faithfully at our office in Washington but he has traveled over the United States, contacting many of his professional confrères and explaining to them the purpose for which the Procurement and Assignment Service was organized. His services have been most valuable and have helped to take us a long way in accomplishing the objectives for which it was created.

The Directing Board expresses to Colonel Seeley its gratitude and thanks for his unselfish devotion to the organization of the Procurement and Assignment Service and wishes for him the greatest success in his new assignment.

FRANK H. LAHEY, M.D., Chairman.
HARVEY B. STONE, M.D.
HAROLD S. DIEHL, M.D.
JAMES E. PAULLIN, M.D.
C. WILLARD CAMALIER, D.D.S.

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MEMORANDUM FOR ADMINISTRATORS OF HOSPITALS APPROVED FOR INTERNSHIPS AND/OR RESIDENCIES

The directing board of the Procurement and Assignment Service has addressed the following memorandum to the administrators of all hospitals approved for internships and/or residencies:

The directing board has appointed the following hospital administrators to serve on an advisory Committee on Hospitals: Dr. M. T. MacEachern, associate director, American College of Surgeons, Chicago, chairman; Dr. Claude W. Munger, director, St. Luke's Hospital, New York; Dr. Benjamin W. Black, medical director, Alameda County Institutions, and superintend-

ent, Alameda County Hospital, California; Dr. Lucius Roy Wilson, superintendent, Hospital of Protestant Episcopal Church, Philadelphia, and Dr. Basil C. MacLean, director, Strong Memorial Hospital, Rochester, N. Y., and president, American Hospital Association.

This committee has recommended, and the directing board has approved, the following procedures and criteria to be used in preparing the revised lists of essential hospital staff members:

The many changes which have occurred in appointments of hospital interns and residents on or about July 1 and the urgent need of the armed forces for young medical officers make necessary at this time a revision of the lists of essential personnel on hospital staffs. Believing that you will prefer to make voluntary reductions in your staff, we ask for your fullest cooperation in our effort to assist you in maintaining your minimum essential staff.

Each hospital administrator has a definite responsibility to provide the necessary medical services for the patients of his hospital. In many hospitals, particularly those which care for charity patients and which are affiliated with medical schools, the retention of a minimum resident staff is essential both for the care of the patients and for medical education. Nevertheless, it is obvious that drastic reductions in the peacetime staffs of hospitals must be made if the needs of the armed forces are to be met.

Analysis of the original lists of essential personnel in hospitals indicates that in many institutions further reductions can and should be made. In preparing these lists the attitude should be not "How many can we possibly retain?" but "How many can we possibly release for service with the armed forces?"

1. In compiling lists consider only full time staff members, part time staff members conducting essential hospital services (e. g. roentgenologist), visiting staff members who actually conduct ward work, residents and interns.

(a) Residents should be considered essential on the basis of general hospital work and not because of the service they render in the care of private patients, except as it contributes to their training.

(b) Individuals who have completed one year of internship shall be considered available for military service unless they are appointed to an essential position as a hospital resident.

2. Do not consider visiting or courtesy staff members who serve only private patients. Their essentiality will be determined by the local Procurement and Assignment committees on the basis of their services to the community as a whole rather than their need in any particular hospital.

3. The residency program must be drastically curtailed and the number of residents decreased in numbers.

4. Subsequent to July 1, 1942 and during the war emergency, designation of a man as an essential hospital resident or fellow should not exceed two years beyond the completion of one year's internship.

5. Having determined the minimum number of essential positions, these positions should be filled as far as possible by:

(a) Women.

(b) Young men physically ineligible for military duty and older men.

6. Visiting staff members should be asked to contribute additional hours to their duties in the hospital.

7. Routine work of residents and interns should be delegated as much as possible to qualified nonmedical personnel for clerical, laboratory and other services.

8. One copy of the revised hospital list should be sent to the state chairman of the Procurement and Assignment Service and one copy to this office within one week of the receipt of this letter. A sample form for this report is enclosed.

9. It is important that every hospital staff member be informed by the hospital as to classification as essential or available, subject to approval by the Procurement and Assignment Service.

10. Your continued cooperation in this effort on the part of the Procurement and Assignment Service to provide medical personnel for the armed forces and at the same time to maintain essential hospital services during the war will be appreciated.

A blank is provided on which hospital administrators are requested to furnish full information regarding all staff members.

CRITERIA FOR DETERMINATION OF ESSENTIAL PHYSICIANS IN INDUSTRIAL MEDICINE

The situation regarding recruitment of physicians now employed in industrial medicine has caused the directing board of the Procurement and Assignment Service to send the following memorandum to all state chairmen relative to the methods by which the essentiality of physicians engaged in industrial medicine may be determined:

A serious situation is developing in some states because physicians under 45 years of age who are essential in their present positions as key men in industrial practice are being declared available by state chairmen or are being approached directly by recruiting boards with instructions to apply for a commission in the Army Medical Corps.

The Selective Service System and the Surgeon Generals of the Army and of the Navy are cooperating with us to keep at their posts the physicians declared to be essential by our state committees. In determining essentiality, please be guided by the following criteria, which have been recommended by the Committee on Industrial Health and Medicine and have been approved by the directing board.

In some instances an industrial physician under 37 years of age will be deemed essential according to these criteria, and yet you may think he should be made available. In this case it is your responsibility to obtain a replacement and to notify the central office at once when the industrial physician will be available.

A physician employed in industry is deemed to be essential when the following conditions exist:

A. Full time industrial physician.

1. The physician is employed by an industry which is manufacturing war materials exclusively or under priority ratings, and

2. The physician gives his full time to the industry or forty or more hours weekly, has been so employed for at least two years, or is especially trained for that purpose and is carrying on an acceptable health maintenance program and

3. The physician is performing the function of a medical director or department head or of a specialist or is the only physician employed.

4. Assistant physicians who perform routine functions under direction and are employed on a full time basis are deemed essential until they can be replaced within a reasonable time (three to six months).

B. Part time industrial physician.

1. The physician serves part time two or more industries engaged exclusively in the manufacture of war materials or under priority ratings, provided his total part time service is the equivalent of forty or more hours weekly. Note: The physician who serves on call only is not deemed to be essential.

C. The physician serves a state industrial hygiene bureau on a full time basis.

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POLICIES GOVERNING INITIAL APPOINTMENT OF MEDICAL OFFICERS

The Surgeon General of the Army published detailed information concerning policies governing the initial appointment of physicians as medical officers on April 23, 1942. Necessary changes are given wide publicity, at his request, in order that the individual applicants, and all concerned in the procurement of medical officers, may know the status of such appointments.

The current military program provides for a definite number of position vacancies in the different grades. The number of such positions must necessarily determine the promotion of officers already on duty and, in addition, the appointment of new officers from civilian life. Such appointments are limited to qualified physicians required to fill the position vacancies for which no equally well qualified medical officers are available. Such positions calling for an increase in grade should as far as possible be filled by promotion of those already in the service and not by new appointments.

If this policy is not followed, it would definitely penalize a large number of well qualified lieutenants and captains already on duty by blocking their promotions which have been earned by hard work. In view of these facts it has been deemed necessary to raise the standards of training and experience for appointment in grades above that of first lieutenant.

With this in view, the Surgeon General has announced the following policy, which will gov-

ern action to be taken on all applicants after Sept. 15, 1942:

All appointments will be recommended in the grade of first lieutenant with the following exceptions:

Captain.—1. Eligible applicants between the ages of 37 and 45 will be considered for appointment in the grade of captain by reason of their age and general unclassified medical training and experience.

2. Below the age of 37 and above the age of 32, consideration for appointment in the grade of captain will be given to applicants who meet all of the following minimum requirements:

(a) Graduation from an approved medical school.

(b) Internship of not less than one year, preferably of the rotating type.

(c) Special training consisting of three years' residency in a recognized specialty.

(d) An additional period of not less than two years of study and/or practice limited to the specialty.

3. Eligible applicants who previously held commissions in the grade of captain in the Medical Corps (Regular Army, National Guard of the United States, or Officers Reserve Corps) may be considered for appointment in that grade provided they have not passed the age of 45 years.

Major.—1. Eligible applicants between the ages 37 and 55 may be considered for appointment under the following conditions:

(a) Graduation from an approved school.

(b) Internship of not less than one year, preferably of the rotating type.

(c) Special training consisting of three years' residency in a recognized specialty.

(d) An additional period of not less than seven years of study and/or practice limited to the specialty.

(e) The existence of appropriate position vacancies.

(f) Additional training of a special nature of value to the military service, in lieu of the foregoing.

2. Applicants previously commissioned as majors in the medical Corps (Regular Army, National Guard of the United States or Officers Reserve Corps) whose training and experience qualify them for appropriate assignments may be considered for appointment in the grade of major provided they have not passed the age of 55.

Lieutenant Colonel and Colonel.—In view of the small number of assignment vacancies for individuals of such grade, and the large number of reserve officers of these grades who are being called to duty, such appointments will be limited. Wherever possible, promotion of qualified officers on duty will be utilized to fill the position vacancies.

Much misunderstanding has arisen concerning recognition by specialty boards and membership in specialty groups. It will be noted that mention is not made of these in the preceding paragraphs. This is due to the variation in requirements of the different boards and organizations. Membership and recognition are definite factors in determining the professional background of the individual but are not the deciding factors, as so many physicians have been led to believe.

The action of the grading board, established by the Surgeon General in his office, is final in tendering initial appointments. Proper consideration must be given such factors as age, position vacancies, the functions of command and original assignments. All questionable initial grades are decided by this board. Owing to the lack of time, no reconsideration can be given.

There are in the age group 24-45 more than a sufficient number of eligible qualified physicians to meet the Medical Department requirements. It is on this age group that the Congress has imposed a definite obligation of military service through the medium of the Selective Service Act. The physicians in this group are ones needed now for active duty. The requirements are immediate and imperative. Applicants beyond 45 years may be considered for appointment only if they possess special qualifications for assignment to positions appropriate to the grade of major or above.

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RESTRICT SALE OF ALL QUININE

The Health Supplies Branch of the War Production Board called attention, August 17, to the fact that all stocks of quinine and totaquine,

no matter how small, have been subject to the restrictions of Conservation Order M-131 since June 19.

Prior to that date, stocks of 50 ounces or less could be freely sold. Since June 19, retail druggists and all other sellers have not been permitted to sell quinine or totaquine for any purpose except as an antimalarial agent. The order extends to powder, capsules, solutions, pills and tablets and to quinine or totaquine stocks of all other descriptions whether or not packages have been opened.

The same sales restrictions apply to cinchonine, cinchonidine and quinidine, which are covered by Order M-131-a. No stocks of these may be sold except as an antimalarial agent and, in the case of quinidine, for the treatment of cardiac disorders.

The branch stresses that these drugs are urgently needed for military antimalarial use. Supplies are limited since their raw material source, cinchona bark, comes in most part from Java.

Druggists and pharmaceutic and proprietary manufacturers may not use their stocks of quinine or other alkaloids of cinchona bark in the manufacture of products which are designed for other than permitted purposes. These restrictions extend as well to dispensing of the drugs on physicians' prescriptions.

The practical effect of these regulations as far as manufacturers are concerned is to prohibit the use of their stocks in the manufacture of products such as elixir of iron, quinine and strychnine phosphates, coryza tablets and other formulas designed for treatment of other than malarial ailments. However, any such products which were manufactured prior to the effective date of the order controlling the particular drug involved may be sold without restriction.

Druggists having stocks of quinine, cinchonine, cinchonidine and quinidine in excess of their requirements for the permitted uses are urged to return the drugs to their source of supply.

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CHICAGO GROUP ON ACTIVE DUTY

Thirty-seven physicians, mostly at present or formerly associated with St. Luke's Hospital, Chicago, were commissioned in the United States Army Medical Corps in July and ordered to report for duty at an air corps medical unit in a western state. The following are members of this group: Majors James W. Clark, Percy J. Ross, Fred E. Ball, Claude N. Lambert, John I. Brewer and Robert E. Williams; Capts. Willis G. Diffenbaugh, John H. Pribble, Howard W. Merideth, Chester Coggeshall, Robert G. McMillan, William L. Waskow, Leslie R. Grams, George A. Ingrish and Paul H. Dube; Lieuts. LeRoy E. Walter, Claude R. Snead, Frank W. Jones, Joseph A. Davis, William Burgett Smith, Clarence Kristiansen, John B. Case, Carl H. McLauthlin, John T. Parker, Don J. Hunter, Frank R. Gondek, Lawrence De Renne, Robert C. Lawson, Ryland A. Buckner, Thomas G. Hobbs, Hosmer T. Merrell, Stephen C. Scott and Richard Oliver. Lieuts. J. S. Clark Jr., Francis S. North and Brendan P. Phibbs were ordered to report to Carlisle Barracks, Carlisle, Pa., for training before joining their units elsewhere.

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UNITED CHINA RELIEF COMMITTEE

The president of the Chicago Medical Society, Dr. Oscar Hawkinson, has appointed a committee to represent the medical profession in the Cook County, Ill., campaign for the United China Relief. This committee, comprising Drs. Frank P. Hammond, chairman, Wilbur E. Post, James G. Carr, George W. Post and James H. Hutton, in appealing for funds, points out that doctors, nurses and medical technicians have been the backbone of the famous and unique "American Expeditionary Force in China" and have been credited with sustaining Chinese morale and defeating Japanese propaganda through five years of war in China. Money is desperately needed at once, the committee says. Checks should be made out to United China Relief, Inc., and mailed to this committee at the offices of the Chicago Medical Society, 30 North Michigan Avenue, Chicago.

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TWO DOCTORS APPOINTED FOR WAACS

The War Department recently announced the appointment of two "on contract" surgeons for the Women's Army Auxiliary Corps now stationed at Fort Des Moines, Iowa. They are Dr. Mary L. Moore of Rifle, Colo., and Dr. A. Elizabeth Garber of Chicago. Secretary of War Stimson said at a press conference recently that the WAACs eventually would have women doc-

tors assigned to them full time but that, while the corps is getting its full strength, appointments would be on a contract basis.

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AVIATION MEDICAL EXAMINERS

A routine course of instruction to qualify army medical officers for duty as aviation medical examiners recently began at the School of Aviation Medicine, Randolph Field, Texas. The following officers were enrolled from Illinois:

Edward G. Cada, Captain, Berwyn.
William W. Curtis, 1st Lieut., Chicago.
Louis S. Frank, 1st Lieut., Chicago.
Dominic J. Haftkowski, 1st Lieut., Chicago.
Edgar O. Hughes, 1st Lieut., Washington.
Walter S. Miller, Captain, Rockford.
Theodore C. Papermaster, 1st Lieut., Chicago.
Jack L. Restibo, 1st Lieut., Chicago.

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MEDICAL AND SURGICAL RELIEF COMMITTEE OF AMERICA

This committee, with headquarters at 420 Lexington Avenue, New York City, has in the last two years furnished supplies valued at $466,815.95 to needy hospitals, evacuation centers and welfare organizations in the United States, Alaksa and Hawaii, to Russian relief groups, to the British Red Cross, to the American Friends Ambulance Unit in China and to the Free French. At the annual meeting of the executive board of the committee in New York on August 19 Dr. Joseph P. Hoguet, national medical director, said that the greatest demand had been for medical and surgical instruments, antitoxins, vitamin concentrates and the sulfonamide drugs. In view of the increasing number of the physicians who serve on this committee who have gone into the military service, plans are being made to form a group of nonprofessional men and women to supplement the work of physicians affiliated with the committee. Efforts also are being made to increase the present professional membership of the committee from 415 to 600 by the end of the coming fiscal year. In a news release the committee acknowledged contributions of drugs and instruments from numerous organizations throughout the country, including medical societies, hospitals, woman's auxiliaries, clinics, pharmaceutic houses and other manufacturing companies.

CONSERVATION OF MEDICAL SUPPLIES

The medical profession and the hospitals of the nation will shortly be obliged to depend upon dealers' stocks of medical and hospital supplies if they are to maintain their present level of efficiency. The continued shortage of raw materials makes it increasingly evident that even the armed forces may have difficulty in securing their requirements. Stocks on the shelves of the dealers of this nation constitute the only reserve of medical and hospital equipment which may be available in the near future to meet civilian needs. The hoarding and dead storage of equipment and supplies for a possible emergency should, therefore, be discouraged. Any unexpected emergency could be met by our present civilian medical and hospital resources; continued disaster could only be met by the utilization of military stores which would be made available if there were urgent need.

Any surplus or obsolete equipment now in the possession of physicians and hospitals ought not to be dispersed at this time, because of the difficulty of replacement and the possibility that it may be needed for the establishment of emergency base hospitals.

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PARACHUTES TO DROP DOCTORS AND NURSES

Regional Director J. M. Loughlin of the first civilian defense area recently announced the formation of a parachute corps to drop doctors and nurses to stricken areas in out of the way places. The corps was organized by the Civil Air Patrol in New England under the direction of Major R. S. Fogg, regional commander of the Civil Air Patrol, on the rolls of which already are twenty-five doctors and thirty nurses, some of whom own their own airplanes, according to the Boston *Globe*.

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At the end of the fifth round, the heavyweight staggered to his corner in a dazed and battered condition. His manager approached him and whispered in his ear: "Say, Slugger, I've got a swell idea! Next time he hits you, hit him back!"

Original Articles

SURGERY OF THE BILIARY TRACT

VIRGIL S. COUNSELLER, M. D.
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ROCHESTER, MINNESOTA

The treatment of patients with disease of the biliary tract is one of the chief tasks of the surgeon. The frequency of acute cholecystitis with stones, stone in the common bile duct and stricture of the extrahepatic bile ducts make frequent discussions of their management desirable. The procedures employed for the correction of each condition have been fairly well standardized and are understood by the general surgeon; nevertheless, opinions differ as to what method or technic is best suited in a particular case. The decision must, therefore, rest upon the surgeon's own judgment and ability.

The recent improvements in preoperative and postoperative management, together with a better understanding of the physiology of the liver in some of the more complicated cases, have contributed enormously to a reduction in the hospital mortality and morbidity.

Acute cholecystitis. The question of immediate surgical treatment or conservative treatment in cases of acute cholecystitis has been debated at sectional meetings during recent years and the evidence seems to favor early surgical treatment but by no means is the opinion anywhere near unanimous. The experience of Heuer[3] in his report of 153 cases of acute cholecystitis is of considerable interest. He stated that the clinical manifestations fairly closely parallel the pathologic process in the gallbladder, but in other cases, even in the presence of subsiding or minimal symptoms, the pathologic process in the gallbladder may proceed to gangrene and perforation of the organ. He said that these complications occurred in approximately 20 per cent of all cases of acute cholecystitis. In this series of cases operation was performed deliberately during the acute stage in an attempt to lower the mortality from gangrene and perforation of the gallbladder. The total mortality was 3.2 per cent. However, in the 137 in which perforation and gangrene had not occurred the mortality dropped to 2.1 per cent. The mortality in the sixteen cases in which operation was performed after perforation had occurred was 12.5 per cent. These figures are comparable to those of most experienced surgeons and the point to be emphasized is that in approximately 20 per cent of these cases the pathologic condition progressed to gangrene and perforation. This is quite opposed to the generally accepted opinion in general practice. It is important, however, to stress that involvement of the general peritoneal cavity with bile peritonitis and a rapidly fatal course will occur in only about 2 per cent of such cases. When gangrene and perforation develop, the disease is usually confined to the gallbladder, hepatic region and the adjacent colon, duodenum, stomach and omentum. Early perforation of the gallbladder into the liver with abscess formation is not uncommon and is to be suspected by a continuation or exacerbation of the acute symptoms and tenderness over the edge of the liver.

Read before the meeting of the Illinois State Medical Society, Springfield, Illinois, May 19-21, 1942.
Joint Session of Sections on Medicine and Surgery.

It is important, it seems to me, to remember that acute cholecystitis with calculi is not quite analogous to acute appendicitis, primarily since the calculi unquestionably have been present for some time and have produced irritation and digestive manifestations; furthermore, it is not connected with a portion of the intestinal tract that harbors countless numbers of pathogenic bacteria. The appendix is part of the intestinal tract; therefore, it usually contains feces, and acute inflammation of such an appendage always is cause for urgent operation. The mechanism of infection in the gallbladder and biliary tract is quite different. Rarely is the infection due to Escherichia coli. Since the liver is a detoxicating organ and excretes organisms from the blood stream, it is reasonable to assume that the bacteria reach the gallbladder in this manner. Once single or multiple calculi appear within the gallbladder or common bile duct, the mechanism for the acute attack is completely prepared. The severity of the symptoms will depend for the most part upon the completeness and permanence of the obstruction of the cystic duct together with the degree of infection within the gallbladder. If the cystic duct becomes obstructed and contains a virulent organism, severe colic and fever will result. The usual clinical picture, however, of acute cholecystitis is pain, a temperature of 100° and 102° F., and moderate leukocytosis. The gallbladder is usually tender but may or may not be palpable. These symptoms in most cases subside within three or four days. It has always been a good rule that if the fever becomes greatly elevated at the onset and remains continuously high and is associated with exquisite tenderness there is serious danger of early perforation; and drainage is indicated without delay. I believe that this type of condition is different from those that progress more slowly and become gangrenous and perforate.

In most cases of acute cholecystitis the patients have experienced previous attacks, and when first seen in the acute attack twelve to twenty-four or thirty-six hours may have elapsed since the onset. Zollinger's[8] experience in this connection substantiates this view. An analysis was made of 121 consecutive cases of acute cholecystitis in which operation was performed in the Peter Bent Brigham Hospital[8] during a recent period of five years. In approximately a fourth of the cases the patients entered the hospital either after the acute attack had subsided or in the terminal stages of an acute attack; therefore, in a large percentage of the cases operation within the early phase of the attack would have been impossible no matter how desirable. Hydrops of the gallbladder associated with stone impacted in the cystic duct or a cholecystoduodenal or gastric fistula is an example of a fortunate condition during the acute attack. In the case of an impaction of the cystic duct, the inflammatory products in the gallbladder are absorbed, while in the case of the fistula the infected contents are discharged into a segment of the intestinal tract which is relatively free from infection.

The surgical judgment in such cases must be augmented by a fundamental knowledge of the changing pathologic picture, since it has a distinct bearing upon the surgical difficulties which may be necessary to deal with. Within a few hours following the acute attack, pericholecystitis and pericholedochitis develop, as manifested grossly by swelling and edema which distort the structures and cause them to be quite friable. It is in this situation that the cystic artery is often torn off, producing severe hemorrhage and technical difficulties which may result in injury to the common bile duct. The wall of the gallbladder becomes greatly thickened and difficult to handle. As the inflammation subsides, contraction and scarring ensue, which may be sufficiently extensive to obliterate the gallbladder completely. This process often distorts the common bile duct and the cystic duct upward, thus exposing the common bile duct to injury unless this altered relationship is immediately seen by the surgeon. Rarely is this condition complicated by intrahepatic lesions of serious nature, except in cases of obstruction of the common bile duct associated with jaundice and biliary cirrhosis of varying degree. The serious import of jaundice is well known and one may have to modify the technical procedure in dealing with the jaundice.

The technical procedures which may be instituted in the surgical management of acute cholecystitis with stones are cholecystostomy and cholecystectomy, with or without choledochostomy. Everyone is familiar with the frequency

of secondary operations on the gallbladder and bile ducts following cholecystostomy; therefore, it should be quite clear that cholecystostomy should only be done as a second choice and not as a preferable procedure. Patients with jaundice, those seriously ill and suffering from toxemia, those who have cardiac decompensation and myocardial damage, obese patients and those who have pancreatitis with regions of fat necrosis are most likely candidates for cholecystostomy. It should be looked upon as a life-saving measure and not as a curative procedure entirely, and when the patient's condition permits, further corrective measures may be undertaken if desirable. Foss and Lillie[2] recently studied 140 cases in which a secondary operation on the biliary system was required. They discovered previous cholecystostomy had been performed in 74.2 per cent of these cases. This is evidence that if patients live long enough 75 per cent of those who have had their gallbladder drained will require subsequent surgical treatment.

The operation of choice is cholecystectomy, with or without exploration and drainage of the common bile duct. The question whether the common bile duct should be opened in every instance is getting much attention just now. Frankly, I believe this decision must again rest with the individual surgeon. It is undoubtedly true that there is a greater incidence of stones in the common bile duct than was previously considered. It is rare to find stones in the common bile duct when there is a single cholesterol stone in the gallbladder, and stones are not likely to be present in the common bile duct if it is normal in size and if there is no gross abnormality of the wall of the duct, such as edema, lymphangitis, enlarged lymph nodes or fixation. However, if multiple small stones and stony sediment are present in the gallbladder, the chances are much greater that the common bile duct will contain similar material and it should be opened and drained, preferably with a T tube. On this basis, the pathologist should be quite accurate in estimating the possibility of stones in the common bile duct. Jaundice associated with acute cholecystitis requires that the common bile duct be explored although the disease may be due to inflammation rather than calculi.

Cholecystectomy in acute cholecystitis can be simplified and the dangers attending it can be minimized. An adequate incision should always be made. This must conform with the size and sex of the patient, because the gallbladder is situated differently in male and female, particularly when it is acutely diseased. Evacuation of a tense gallbladder so that it can be more easily grasped with forceps for traction is quite helpful. Years ago, W. J. Mayo[6] pointed out the ease with which an acutely inflamed gallbladder can be removed from above downward by incising its peritoneal attachment adjacent to the liver fossa. The edematous fluid can then be squeezed out of the cystic duct so that it is readily seen, separated and clamped. The cystic artery is ligated separately. By observing these maneuvers, the incidence of injuries to the common bile duct can be reduced. When infection and edema involve the gastrohepatic ligament, exposing and opening the common bile duct appears to be a more formidable task since the tissues tear and bleed easily. The common bile duct occasionally is covered with several small branching veins but the bleeding from these can be satisfactorily controlled if the gastrohepatic ligament is properly mobilized by the assistant. The common bile duct should always be identified by aspirating it with a long, small caliber needle. Making this a routine procedure will save one a very serious situation if the portal vein, which often appears similar to the common bile duct should accidentally be opened. I mention these incidents because by far the greatest number of accidents to the common bile duct are incidental to troublesome hemorrhage. Bleeding from the cystic artery cannot be safely controlled by sponging and blind clamping of tissues. Here again, if exposure has been adequate the structures can be easily grasped with the fingers, the blood sponged away and the severed artery identified and clamped.

It is obvious, therefore, that acute cholecystitis with stones presents many difficult and serious situations which may or may not require immediate surgical interference. But since it is of such a character, the condition most certainly should be treated as a surgical emergency in the hospital where the patient can be seen frequently to determine the progress of the infection and watched especially for the develop-

ment of pain and tenderness. Nausea and vomiting may greatly dehydrate the patient so that intravenous injection of solutions becomes imperative. My impression is that in the majority of cases it is preferable to operate when the temperature and pulse return to normal, usually in three to five days after the attack. The tissues are easier to manipulate at this time since the infection is subsiding; moreover, I believe the respiratory complications are less than they are in the more acute stage of the disease. Certainly it would be difficult to improve the convalescence. In those cases in which gangrene, perforation and localized abscesses may occur, the mortality will be greatly reduced by the direct application of 5 or 6 gm. of sulfathiazole. This is preferable to sulfanilamide because it is absorbed more slowly.

Stone in the common bile duct. The history of jaundice or its presence always makes examination of the common bile duct necessary. If the duct is dilated is should be opened and explored with suitable probes or scoops, but it must be noted that in the case of a functionless gallbladder the common bile duct will be enlarged but may not contain stones. It is, of course, possible to have stones in the common bile duct without jaundice or colic, which is the chief reason why many surgeons are now advocating routine exploration of the common duct when cholecystectomy is performed.

The greatest concern regarding stone in the common bile duct is when it occurs some months or years after cholecystectomy. The presence of a stone in the common bile duct is indicated if there is typical colic associated with chills, fever and jaundice. However, it must be kept in mind that typical attacks of colic, often accompanied by slight jaundice, may occur following cholecystectomy in the absence of a stone in the common bile duct, especially if there had been much cholangitis or pancreatitis.

Because of the discrepancies in diagnosis of stone in the common bile duct the patient should be studied in the hospital in order to determine any fluctuation in the concentration of the serum bilirubin and also to determine the hepatic function. Patients who have had repeated attacks of colic with chills and fever over an extended period are certain to have some degree of hepatic damage plus infection along the biliary tree in the portal spaces. I[1] demonstrated this a few years ago in my work on biliary cirrhosis. If a stone becomes impacted in the ampulla of Vater the concentration of serum bilirubin usually becomes fixed at 20 to 30 mg. per 100 c.c. However, if impaction is not constant, the jaundice fluctuates.

The technical difficulties in performing choledocholithotomy when the gallbladder has been removed should be stressed. It may be a comparatively easy procedure but it can be extremely difficult, especially if there had been much infection and drainage following the cholecystectomy. The method of approach to the duct is one of the secrets of success. Some surgeons advise that the approach be made mesial to the scar by first exposing the pylorus and duodenum. It is far safer and simpler to excise the scar completely through the peritoneum. This structure is then retracted laterally while separating the omentum and intestine, which are retracted mesially. This separation is continued upward to the liver by using the suspensory ligament as a guide. The gastrohepatic ligament can then be palpated by placing one finger through the foramen of Winslow. The duodenum can then be retracted with gauze, revealing the possible site of the common bile duct if present, which is further identified by aspiration. This type of approach is practically extraperitoneal and avoids any danger of hemorrhage or tedious dissection.

The drainage of the common bile duct following the removal of stones as a secondary operation is of considerable importance. Prolonged drainage is essential, particularly if there has been an associated cholangitis or pancreatitis. The period of drainage may vary from one to two months to a year depending upon the severity of the infection. The T tube is most suitable for prolonged drainage, since it will remain in the common bile duct without irritation and can be easily removed when desired by gentle traction without injury to the duct, and the opening in the duct will close promptly. Furthermore, the flow of bile can be controlled by clamping the tube; also, the bile ducts can be irrigated at any time.

Cholangiography has now become a routine procedure when using T tubes. The injection

of a radiopaque substance into the tube will reveal the patency of the duct and the ampulla. This is always advisable before the tube is removed, and the information gained as to the patency of the duct should be a permanent part of the patient's record.

Benign stricture. Strictures of the extrahepatic bile ducts present without question most serious and difficult surgical problems. Many papers have been presented giving the number of patients treated by individual surgeons and by groups. The end results as listed by competent surgeons reveal a mortality rate of 10 to 20 per cent. In a general discussion of surgery of the biliary tract, such as this, it must be emphasized that stricture of the common bile duct or hepatic duct is produced by trauma during a previous operation on the gallbladder or bile ducts and, therefore, should be preventable. By far the greatest number of such strictures are produced by clamping either the hepatic duct or common bile duct in an effort to control bleeding from the cystic artery which has become free during the course of cholecystectomy. Lack of sufficient exposure and excessive traction of tissue spell disaster in performing cholecystectomy, particularly in cases of acute or subacute cholecystitis. The dictum attributed to Lagenbock certainly is pertinent here, namely, "expose the dangerous areas first." When one learns that hemorrhage from a good sized artery is best controlled by the fingers or hand and not by sponges and blind clamping with a forceps, these surgical accidents to important structures will greatly diminish. The late W. J. Mayo told surgeons repeatedly that the tips of their fingers are their eyes within the abdomen so they should protect their fingers always; they are the most valuable instrument surgeons have.

The amount of infection in the bile passage at the time of injury is extremely important in regard to subsequent events. If the common bile duct or hepatic duct is clamped and ligated during the performance of cholecystectomy for chronic cholecystitis with stones, there will be immediate evidence of complete obstruction without much evidence of cholangitis. The usual symptoms of severe jaundice predominate. When infection is already present in the sacculi of the ducts at the time of injury, symptoms of cholangitis plus jaundice predominate. This is the usual clinical picture when the injury occurs following surgical procedures for acute or subacute cholecystitis. If the duct has been injured and unnoticed, immediate and prolonged drainage of bile is beneficial in relieving the residual infection and preventing fibrosis and parenchymal damage. Prolonged or intermittent drainage of bile is indicative of injury of a bile duct. When the drainage of bile ceases, jaundice occurs and is associated with colicky pain, chills and fever. When the discharge of bile recurs, other obstructive symptoms subside. These alternating symptoms usually persist weeks or months and are presumptive evidence of complete stricture. Whenever the stricture is partial or incomplete, sufficient bile may enter the duodenum to prevent much jaundice but the concentration of serum bilirubin will fluctuate and there the van den Bergh reaction will be direct. In evaluating the surgical risk and probabilities of repair, decision must be guarded by the general systemic effects of biliary obstruction, cholemia and intrahepatic infection. Judd and I[4] in 1927 pointed out that strictures of the common bile duct differ from those following aseptic ligation and that a general obliterative cholangitis may exist months before signs of stricture appear.

The surgical procedure for a benign stricture will depend upon the condition encountered at the time the gastrohepatic ligament is exposed; therefore, one will have to be prepared to apply that method which presents the least difficulty and will have the greatest chance for success. I think it is of particular interest that the operation of direct anastomosis of the duct to the duodenum, described by W. J. Mayo in 1905, which laid the foundation for future plastic operations upon the extrahepatic biliary ducts remains the most satisfactory operation today when it can be applied. Therefore, if sufficient normal duct remains above the stricture to permit accurate anastomosis of mucous membrane to mucous membrane to an opening in the duodenum without tension, good results will follow. The percentage of good and lasting results will decrease as the site of the stricture moves upward from the wall of the duodenum to the hilus of the liver. For example, in a consecutive series of ninety-eight cases of benign stricture, Walters

and Lewis[7] were able to perform choledochoduodenostomy in thirty-four, with good results in twenty-eight cases, while in the same series, hepaticoduodenostomy was performed thirty-one times and only thirteen patients were in good condition at the time of their report. Plastic operations of the Heineke-Mikulicz type are less favorable unless, as Lahey[5] pointed out, a T tube can be inserted through a separate incision in the duct above the stricture, the lower end of the tube passing beyond the incised stricture. Rubber tubes may be used to take the place of a destroyed duct, but the tube should not pass beyond the ampulla of Vater. The Mayo-Sullivan tube is of great value in performing right and left hepaticoduodenostomy or when a short stump of the common hepatic duct is to be joined to the duodenum. The production of an external biliary fistula and subsequent transplantation is an unsatisfactory procedure, to be used only when there is not any evidence of extrahepatic ducts. Fortunate is the patient whose gallbladder is still intact if he has a stricture of the common bile duct. In such a case the simple procedure of cholecystogastrostomy is sufficient.

Preoperative and postoperative treatment. All jaundiced patients should be observed in the hospital for several days before any surgical operation is done. It is vital to determine beforehand the prothrombin clotting time and the extent of hepatic damage.

Hemorrhage is now controlled quite satisfactorily by the administration of vitamin K. It can be given intramuscularly, intravenously, or by mouth, in the form of concentrates of the crude material or in the form of synthetic compounds exhibiting vitamin K activity (napthoquinones). Of the latter, 1 to 2 mg. daily for one to three or four days given by mouth, together with 10 to 15 grains (0.65 to 1 gm.) of animal bile salts, has proved to be adequate, or 1 to 2 mg. can be given intravenously or intramuscularly without the bile salts. Our method at the Mayo Clinic is to give vitamin K postoperatively for four or five days and observe the prothrombin clotting time for five days to a week and to administer vitamin K any time a rise in the prothrombin time is noted.

Extensive damage to hepatic function is often reflected in the failure of response to vitamin K therapy, the diminished excretion of hippuric acid below 1 gm. in four hours, delayed excretion of dye and reduction in the tolerance to glucose. Patients exhibiting hepatic damage of varying degrees will necessarily need prolonged preoperative preparation and, in addition, vitamin K, transfusion and administration of a 10 per cent solution of dextrose and a diet high in carbohydrates. These measures are continued postoperatively until such time as the liver demonstrates its recuperative power and an adequate drainage of bile is established, as revealed by daily reduction of the concentration of serum bilirubin and a general improvement in the patient's response.

SUMMARY

Acute cholecystitis with stones is a surgical emergency. Patients should be admitted to the hospital for observation and immediate surgical intervention should conditions justify it. Early intervention in acute cholecystitis is hardly analogous to early intervention in acute appendicitis. The operation of choice is cholecystectomy, while cholecystostomy should be done in case the risk is poor and as a palliative measure rather than a curative one.

Whether the common bile duct should be opened routinely is a debatable question. Certainly, if there is any degree of jaundice it should be opened. If multiple small stones and sandy material are present in the gallbladder, stones are likely to be present in the common bile duct. A typical biliary colic associated with chills, fever and jaundice occurring months or years after cholecystectomy is presumptive evidence that a stone exists in the common bile duct. It is advisable that patients exhibiting this syndrome should be studied in the hospital prior to surgical interference.

Benign strictures are practically all subsequent to cholecystectomy and therefore, should be preventable. The successful results decrease as the site of the stricture advances from the duodenal edge to the hilus of the liver; that is, a choledochoduodenostomy is more satisfactory than forming a biliary fistula from the liver substance to be transplanted later. The type of surgical repair will depend entirely upon the site of the fistula and the amount of scar tissue.

Preoperative and postoperative care of jaun-

diced patients is extremely vital to the successful conduct of surgical treatment of lesions of the biliary tract.

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IMPROVED METHODS IN THE DIAGNOSIS AND TREATMENT OF PROTOZOAN INFECTIONS OF THE INTESTINE

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The pathogenic intestinal protozoa include three primary groups:

a *Rhizopoda* or those which move by extensions of the ectoplasm or pseudopodia as entameba histolytica. The other members of this group, E. Gingivalis, E. Coli, Endolimax nana, Iodameba Butschlii, are non-pathogenic, while Dientameba Fragilis is of doubtful pathogenicity.

b *Mastigophora* or those which move by thread like or whip like filaments known as flagella, e.g., Giardia Lamblia and Trichomonae. Also the questionably pathogenic chilomastix mesnili.

c *Ciliophora* or Ciliata which move by means of cilia as Balantidium Coli.

There are others which are parasitic to man but not pathogenic. Necessarily my discussion will deal mainly with the most important: 1. Entameba Histolytica. 2. Balantidium Coli. 3. Giardia Lamblia.

1. *Entameba Histolytica.* In consideration of protozoan infections of the intestine were dealing with a group of diseases which have too often been overlooked. *First* — because of the mildness of the symptom picture. *Second* — by the fact these infections were thought to be prevalent in warm climates, but little present in our own climatic belt. *Third* — by the inaccessability of many physicians and patients to the services of well equipped laboratories manned by competent technicians specially trained in this field, and *Fourth* — by our failure to realize that 10% or less of all amebic infections fall into the dysenteric class and that in 90% the symptoms are not those of dysentery.

Competent diagnostic methods have shown us a higher incidence than we realized, and peculiarly enough a rather uniform distribution throughout all parts of the country studied. This has generally varied between 2% to 6% in the case of Entameba histolytica infection with some sections averaging much higher, and while adequate statistics on the other protozoan infections are not available, the infections are present to some extent in Illinois.

The studies of many workers and especially the recent work of Faust has shown that pathology, though at times minimal, is probably present in all histolytica infections. It is also conceded by workers in this field that symptoms, though mild, are probably present in all cases. Therefore, we as physicians should be constantly on the lookout when abnormalities in the function of the gastro-intestinal tract are present, likewise when malnutrition, fatigue, lack of drive, tired legs, aching legs and back, or even dull headache, palpitation, vasomotor irritability, and other symptoms are present. Any case of gastro-intestinal disturbance which is resistant to the usual means of treatment should be suspected. It is as frequently a cause of fullness after meals and belching as is chronic cholecystitis.

The tendency of the ameba to involve the cecum and appendix in 90% of cases and the sigmoid and rectum in 40% of cases should make tenderness of these areas of significance.

In the uncomplicated amebic lesions there is virtually no surrounding tissue reaction, no leucocytosis and no fever. Occult blood in the stools is not always present.

In examining daily stools of patients with entameba histolytica infection we may find numerous cysts in one stool, then have a series of several stools before another appears containing cysts. This makes it necessary never to depend

for diagnosis on the examination of a single specimen alone, but rather one should make repeated examinations at intervals until 3 to 5 stools have been studied. If they are still negative a brisk saline purging or several warm saline enemas given in succession may bring down mucus or other material from the ileocecal area containing the organisms, usually in the trophozoite stage.

The trophozoites, as we know, divide by direct division of the nucleus followed by division of the cytoplasm, and this multiplication takes place in the mucosa of the bowel; but when the trophozoites are extruded through the opening of the ulcers into the lumen of the bowel, if the stool is formed or if conditions are otherwise unfavorable for its continued existence in trophozoite form it rounds up, extrudes red blood cells and other foreign material, becomes smaller and immotile as a precyst, then secretes a cyst wall becoming a cyst, with a single nucleus with centrally placed karyosome and sometimes one or more chromatoidal bodies with rounded ends. It then slowly matures by nuclear division until at maturity it is a cyst of four nuclei and usually with no chromatoidal bodies. It is in this resistant form in which the infection is spread by food handlers, by legs or intestinal droppings from flies or roaches, by contamination of water supplies, or by fertilization of gardens with human excreta. When taken in with food or drink it excysts in the lower ileum where in the metacystic stage the four nucleated cysts have a further division of each nuclei giving rise to eight nuclei each of which take a small amount of cytoplasm as a small trophozoite again ready to invade the mucosa of the ileo-colic region.

METHODS

(1) The original method of demonstrating the motile trophozoite with clear pseudopodia and definitely directional movement is still an excellent one, but requires examination of the freshly passed liquid or semi-liquid stool or material obtained by catheter or proctoscope while it is still warm.

(2) The use of culture media enabled us to grow the trophozoites from cystic forms or from other trophozoites in the stool, therefore, the stool does not necessarily have to be strictly fresh, but should be kept in an incubator until examined. The procedure is adaptable only to trained workers in a properly equipped laboratory and in good hands it probably leads all other methods in accuracy. It requires 24 to 48 hours for final cultural results to be obtained.

(3) The demonstration through the proctoscope of minute reddened superficial erosions at the apex of tiny nodules, situated mainly on the summits of the mucosal folds (which when incised reveal flask like lesions opening into them) is the earliest macroscopic lesion. Later the lesions may be round or oval ulcers with congested thickened edges, but not undermined, or more often typical irregular ulcers with undermined edges and the intervening mucosa remaining normal.

(4) By complement fixation and,

(5) By skin sensitization tests. These two methods are unsatisfactory at present due to the difficulty in preparing a pure antigen. However, since Meleny has succeeded in causing excystation of entameba histolytica cysts in bacteriologically sterile media it appears these two methods may become valuable.

(6) By animal inoculation (Kittens, monkeys, dogs)

(7) The method we find most satisfactory for office use is the *Centrifugation Zinc Sulphate Flotation* technique worked out by Faust and his associates, but as yet not widely used in our own section. It has the advantage of concentrating the cysts so they can be found in numbers and more easily studied. At the same time the cysts of Giardia Lamblia, Chilomastix Mesnili, also the eggs of Ascaris, Trichocephalus Trichyuris, Enterobius Vermicularis, Tenia, and eggs of other helminths are floated to the surface and can be easily found. With this method the stools may be allowed to stand if kept cool, and we have even successfully examined stools shipped from states 2 or 3 days distance. It likewise is representative of the whole stool. It has the disadvantage of destroying the trophozoites and precystic stages and may even at times break up very young cysts.

The method is as follows: *First* — A direct smear in normal salt for trophozoites, also a direct iodine stained smear for early cysts. *Second* — The entire stool is then mixed with tap water enough to make an emulsion, then centrifuged for 60-70 seconds and the supernatent liquid poured off and water again added, shaken well and again centrifuged, this being

repeated several times until the supernatent fluid is reasonably clear. (The sediment containing the cysts if desired can then be stained and examined for cysts, and represents a concentration in number of 4 to 6 times the number present in unconcentrated stool). We then add to the sediment a zinc sulphate solution with a specific gravity of 1.180 (334 grams of Merck's ZnSo4 to a liter of distilled H20), shake thoroughly and again centrifuge for 60-70 seconds. The surface film is skimmed off with a wire loop and stained with D'Antoni's iodine stain (15 grams of powdered iodine in a liter of Sat. solution K.I.) and examined for cysts of ameba and other protozoa, and ova of helminths. We sometimes with this method see as many as 30 cysts per high power field. The entire procedure of preparing the specimen for examination requires but a few additional minutes.

The efficiency of this method has been shown to be:

85% in Trichocephalus Trichuris with centrifuge of 90 seconds
82% in Ascaris with centrifuge of 70 seconds
83% in E. Histolytica with centrifuge of 70 seconds
92% in E. Coli with centrifuge of 70 seconds
34% in Endolimax Nana with centrifuge of 80 seconds
20% in Chilomastix with centrifuge of 80 seconds
90% in Giardia Lamblia with centrifuge of 70 seconds
Balantidium Coli and Trichomonae unknown.
Tenia Group unknown.

In the *treatment* of amebic infection iodides, arsenicals and emetine have proven effective. The iodides are the least toxic and include three main preparations: Chiniofon (Winthrop), (Iodoxyquinoline Sulphonic Acid) also known as Anayodin or Yatren, Vioform (Ciba) (Iodochlorhydroxy Quinoline) and Diodoquin (Searle) (5-7 Di-iodo-8 hydroxy quinoline). Chiniofon is the drug of choice and should be given in doses of 3 to 4 tablets of 4 grains each three times daily for 8 to 10 days. It is not toxic, but often causes diarrhoea which may be controlled by other measures. A single course is often sufficient to clear the colon of ameba, but it may be repeated after two weeks if necessary. Vioform in doses of 4 grains three times daily for 10 days, or Diodoquin in doses of 2 to 3 tablets three times daily for 15 to 20 days give good results. Carbarsone has generally replaced the more toxic acetarsone and treparsol as the arsenical of choice. It is given in 4 grain tablets twice daily for 10 days. Its amebacidal value is high, while its toxicity is low. It is often given either preceding or following a course of one of the iodides. Emetine hydrochloride in doses of one grain daily for six days is of value in controlling the diarrhoeal symptoms of amebic dysentery. It is of most value in the treatment of amebic abscess of the liver or lung, and may be used in one grain doses for not more than 12 days. Aspiration of the abscess may be necessary, and is preferable to surgical drainage.

Emetine is a toxic drug causing muscular weakness, neuritis, myocardial degeneration and occasionally severe diarrhoea, therefore, should be used with caution, and certainly should not be repeated without a rest period of at least 14 days. It is likewise not a very effective amebaecide, Faust showing a recurrence of 81% within three months where emetine alone was used in the treatment of amebic infections.

2. *Balantidium Coli.* Malmsten in 1857 found balantidium coli in the stool of dysenteric patients and was the first to describe it. Since then it has been found in practically all parts of the world. It parasitizes both man and pig, and man's infection has come from swallowing minute portions of the excreta of pigs or of infected man.

It is the largest of the protozoan parasites occurring in man, the trophozoites in unstained specimens being 65 to 100 microns in length and 40 to 70 microns in width. They are oval, slightly greenish and actively motile, and covered with short delicate cilia which are in constant motion. Slightly to the side of the anterior pointed end is a peristome leading into a distinct cleft, the cytostome or mouth which in turn leads into the oesophagus. The endoplasm contains a large kidney-shaped macronucleus with a micronucleus usually lying in contact on its concave side, also one or more pulsating food vacuoles, the posterior one of which apparently empties into a small tube connecting with the surface through an anal opening or cytopyge.

The cysts are spherical or slightly oval in shape, measure 45 to 65 microns in length, are slightly greenish in color, have a doubly outlined cyst wall, and contain a single balantidium which may be observed slowly revolving within

the cyst wall. A macronucleus and a micronucleus may be observed in the granular cytoplasm.

The trophozoites live within and feed upon the tissues of the colon. The food vacuoles of this species have been observed to contain red blood cells, leucocytes, tissue cells, crystals and bacteria.

Reproduction occurs by binary transverse division, the micronucleus dividing first, then the macronucleus, followed by division of the body of the balantidium.

The infection of man is very infrequent and in some instances it apparently lives in the lumen without producing symptoms, and although Walker states the process of penetration of the tissues is not always accompanied by necrosis or ulceration, it usually penetrates the healthy epithelial layer of the intestine, there multiplies and produces ulceration or abscesses of the mucous and submucous coats at times reaching to the muscular layer. The ulcers are round, oval or irregular in shape, with undermined edges and floors covered with pus and necrotic material, and resemble very closely the ulcers produced in the intestine by entameba histolytica (Faust). The intervening mucosa may appear normal, or it may be swollen, and hemorrhagic areas may be present. The ulcers may communicate by passages beneath the mucous membrane. Sections of infected intestine show round cell infiltration, coagulation necrosis in the walls of the ulcers and abscesses, and nests of balantidia in the tissues, capillaries, lymph channels, and neighboring lymph glands.

Symptoms may be absent in some cases, but in the vast majority diarrhoea or dysentery, abdominal colic, tenesmus, nausea, and vomiting occur, while headache, muscular weakness and loss of appetite and weight have been observed. There is usually tenderness along the colon, also anaemia. The stools are usually those of a severe dysentery of the amebic type and contain blood and mucus although constipation may be present.

No specific treatment has been devised, but Acetarsone (Stovarsal) and Carbarsone administered as in amebiasis have given favorable results. Methylene blue enemata in 1 to 3000 strength has been successfully used also.

3. *Giardia Lamblia.* Giardia lamblia is a flagellate of world wide distribution, but increases in frequency as we proceed from the temperate to the warmer climates. It is the most common of the intestinal flagellates in man. The incidence in widely scattered areas varying from 6 to 22 per cent, being most prevalent in children under 10 years of age.

The trophozoites occur in the upper intestine, duodenum mainly, also at times in the gall bladder. It is a pear-shaped organism with a broad rounded anterior and tapering posterior end. Dorsally, the flagellate is convex but ventrally a large ovoid concavity or sucking disc occupies three quarters of the ventral surface. It averages about 14 by 7 microns in size and possesses 8 flagellae. It is seen in motile form in material aspirated from the duodenum but is rarely seen in the stools unless they are very liquid and still warm. Monkeys are apparently the only animal reservoir, but infections have been transmitted to mice, kittens, and dogs. The method of spread is the same as that of E. Histolytica.

Diagnosis is by finding the oval cysts which occur in the lower ileum, in the colon, and in formed stools. They average 7 by 10 microns in size, have 2 to 4 nuclei with well defined nuclear membrane and a small centrally or eccentrically placed karyosome. The cyst wall is unstained but the cytoplasm stains readily.

The pathogenicity of this flagellate in man has been questioned. Many clinicians regard it as the cause of a distinct form of dysentery, but other than superficial erosions secondary to the attachment of large numbers of giardia by the sucking disc to the mucosa of the upper bowel no pathology is known. The effect of gall bladder infestation beyond superficial erosion is not known.

Symptoms attributed to infection of the upper intestine in addition to diarrhoea consist of vague upper abdominal distress and perhaps at times a duodenitis.

Treatment of this parasitic infection has been primarily by the drugs used in the treatment of amebiasis, i.e., Carbarsone, Acetarsone, Treparsol and Chiniofon, and in the same dosage as used in amebiasis. However, these drugs have often failed to completely eradicate the infection. Atabrine in doses of 1½ grains t.i.d., for five days has proven a completely effective agent and

we have been unable to demonstrate cysts after a five day course of treatment. This drug as in malaria is not to be used again until a month has elapsed.

OBSERVATIONS ON THE PSYCHOSOMATIC TREATMENT OF PEPTIC ULCER IN WOMEN

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This study was initiated through observing the frequency with which women, seeking relief from peptic ulcer symptoms, (1) protested against the failure of their men to assume their share of responsibility for the domestic economy; and (2) the promptness with which symptoms subsided when it was suggested to the patients that perhaps they rebelled, not against the need to work, but because their efforts to maintain the family were not appreciated.

A series of fifty private and dispensary patients were gathered on the basis of symptomatology alone. All were women. A diagnosis of peptic ulcer was made in thirty-eight instances by history, physical examination and x-rays of the gastro-intestinal tract. The remaining twelve cases had ulcer symptoms without demonstrable pathology and were therefore excluded from this study. Each of the thirty-eight patients was requestioned from time to time and the original history amplified when possible. An attempt was made (1) to differentiate between psychological and somatic onset and (2) to correlate therapy with the circumstances attending the appearance of symptoms.

The age incidence of the ulcer cases was twenty-four to sixty-four years with two-thirds of the number falling in the age group of thirty-four to forty-four years. All of these except five were or had been married. Four were widows, two were divorced and one was separated from her husband.

A tabulation of the associated pathology revealed dyshaemopoietic anemia in two instances, an elevated basal metabolic rate in three, a moderate arterial hypertension in two, a spastic colon in two, climacteric symptoms in two, tubercular laryngitis in one, infectious arthritis in one and cholecystitis in one.

Nineteen, or half of the women, were, constitutionally, ulcer types.

The Wasserman or Kahn test was negative in every case. As soon as the diagnosis was made each patient was placed on an ulcer diet and appropriate doses of amphojel or aklakine powders.

The following histories are typical of those obtained. They differ in form from the original only as they have been rewritten to present the facts in sequential order.

CASE 1.

Mrs. A. F. Age 40. The patient's earliest memory was of neglect. She was three years old when her father brought home his second wife and became thereafter too absorbed in this new interest to notice his daughter. Her step-mother mistreated her and, worst of all, kept her from her father. She ran away from home when she was nine years old. An Irish family let her stay with them in return for help with the house work and washing. After two years, her father found her and took her home.

Although her father was always good to her, he was seldom about. Her step-mother was consistently abusive; her father blind to her need of affection. It was during this period of her life that her stomach trouble began. When she was thirteen years old she obtained work in a laundry by giving her age as sixteen. She worked there until she was married five years later. Throughout these years she had recurring attacks of ulcer symptoms. No physician was consulted. She obtained relief by taking soda.

One day a gracious youth found her and, like her father or perhaps the prince in the fairy story, carried her away as his bride to the first happiness she had known since the age of three. At last her craving for affection was satisfied. Her ulcer symptoms disappeared and were forgotten.

The current history began when the patient was thirty-two. An attack of acute abdominal pain accompanied by vomiting of blood followed a quarrel with her husband. He had always used alcohol freely but of late had fallen into the habit of absenting himself from home for a week or two at a time while he indulged his appetite for gin. During these periods of neglect, the patient experienced epigastric distress and heart burn. Finally, her husband lost his job; the patient went to work to support the family; the husband became indifferent; they quarreled and the patient vomited blood. Episodes similar to this one recurred at intervals during the succeeding eight years. The patient's need for affection was never more than partly satisfied by the love her children bestowed upon her.

The attack that brought her to the dispensary occurred on her daughter's wedding day. An announcement of the proposed marriage was the occasion of a demand for a church wedding. The patient asked that the wedding date be postponed until the family

finances were less precarious. The daughter rejected the suggestion. The patient thereupon borrowed to pay for the wedding. She was afraid that if she did not do so, her daughter would turn against her. She could not tolerate the thought of losing her child's affection. The patient suffered an attack of acute abdominal pain the morning of the wedding. After the ceremony, and the daughter had left on her honeymoon, she vomited blood.

At the present time, Mrs. F. is free from ulcer symptoms and on a general diet. Her daughter and son-in-law are living with her and sharing the work and expense of the household. They are all happy together. She is no longer required to work beyond physical endurance nor suffer loneliness and neglect. But she still dreams that the man who once brought her happiness will behave again as he did that day.

CASE 2.

Mrs. M. D. Age 56. The patient has had indigestion since girlhood. She was an unwanted child — the last of a large family — and a burden to her parents. She was not allowed to forget that. She married an only son when she was twenty-six years old and became an unwanted daughter-in-law. She did not get along with her husband because he thought more of his mother than he did of her. At no time did he take an adult attitude towards his responsibility as head of the family. Even though the patient worked, their economic status was always desperate. They quarreled constantly. Each quarrel was followed by an attack of epigastric pain. They were divorced after ten unhappy years. Although she loved her husband she could not forget that he denied her the affection she expectd from her married life.

The patient married a second time when she was forty-five years old because she wanted some one to take care of her. This husband is a steady worker. She is as happy with him "as she could be with any man" and was free from ulcer symptoms until, because of age, he lost his job six years ago. She was forced to go to work. This "broke her health." The need to work was reminiscent of her earlier failure to be the center of interest of her family group. The extent to which a husband supported her symbolized the intensity of his interest in her. If he did not work, it was as though he no longer wanted her about.

The patient's symptoms subsided without medication when she was shown that her point of view was one she supposed the outside world took of a working woman. She was led gradually to perceive the substantial compensations of her present martial situation; namely her position as the all-important member of the family. Finally, her nostalgia for that lost moment of her first marriage when she had believed she was no longer the unwanted, ugly duckling of her childhood, was largely overcome.

CASE 3, 4, 5, 6.

There were four additional cases in which the husband of the patient was an only son. In each instance the man demanded lavish attention but gave little in return. He was hypercritical of his wife, chary with compliments. Each husband consulted his mother about the management of his finances and household and ignored the opinions of his wife. In one instance the mother-in-law planned the family vacations. This state of affairs led to frequent quarrels following which the patient would suffer an exacerbation of ulcer symptoms and the husband would go off on an alcoholic debauch or a visit to his mother. In each of these cases the husband was shiftless and the patient worked to help support the family. Each patient was fatigued to exhaustion by holding down a job, doing housework and pampering her husband without winning the compensation of appreciation. Oddly enough the need to work evoked no protest. After all, said the patients, work was simply a means of self preservation. It was not, however, a reason for living. The fundamental difficulty was a conflict between two personalities, both of which expected a monopoly of the other's attention, interest and affection. An explanation of the various factors involved enabled medication to be withdrawn.

CASE 7.

Mrs. A. B. Age 27. This patient had had an unhappy childhood and had always suffered from a "weak stomach." She was a factory worker at the time of her marriage. She married to have a home of her own, children and some one to love her. She began her married life in a furnished room and still lives in one. She is unhappy because she has no possessions, no children and no one attentive to her.

Her ulcer symptoms appeared shortly after her husband lost his position a few months following their marriage. She rather enjoyed returning to work but when she discovered that her husband was spending the money she made on liquor and other women she had a severe attack of epigastric pain. As she was considering a divorce, he obtained a W. P. A. job. For a time he worked steadily and devoted himself to her. Her indigestion disappeared. He was, however, unambitious and irresponsible. He became a drifter. Odd jobs held his interest for short periods. He reverted to his promiscuous habits and her ulcer symptoms recurred.

During the past year the man has made little effort to obtain employment. If he works for a few days, he spends his earnings on questionable friends. As a means of obtaining the affection she craves, the patient now occasionally goes out with other men. A passionate episode may bring temporary surcease from pain but it is too ephemeral, too insincere to be of lasting value. Nor is it successful as a sadistic attack upon her husband. He does not care. Her original need for affection remains unsatisfied. Nevertheless, it was possible in this case to control all symptoms by conversation and sedation alone.

The thirty-eight women in this series were unanimous in associating worry and nervousness with exacerbations of their ulcer symptoms.

They worried over stringent finances and masculine irresponsibility. They quarreled with their husbands and then paid for the quarrel with an attack of epigastric pain. They invariably reacted realistically to financial insecurity. While their men waited for something to turn up, they found work. They paid the bills and then grew nervous and irritable because their husbands did not assume the responsibility they thought they should. In no case, however, did they rebel against poverty *per se*.

In each case studied the date of onset was found to precede the time given in the original history; that is, the patient had suffered for many years, before consulting a physician, from mild epigastric pain or mid-afternoon distress or local tenderness, relieved by taking food or sodium bicarbonate. The significant psychological factor was found in the anamnesis of these early years. It appeared at a time of dramatic change in the emotional relations between the individual and the one most dear to her and recurred whenever a similar crisis arose. Thus in the first history quoted the significant event was the incorporation into the family group of a step-mother who diverted the affection of the father from the patient. It was repeated when the patient's husband, upon whose love she was then dependent, grew indifferent to her.

The psychological factor is a *problem* that can neither be laid aside nor solved. The patient thinks the trouble is a matter of worry and nervousness. As the history develops, she ascribes the worry to financial and domestic difficulties. Only after it has been pointed out to her does she perceive that the problem she has defined is an imperative need to be understood and appreciated. During the moments of her life when her goal has been achieved her symptoms have disappeared even though adverse domestic conditions and economic distress have been as acute as before.

The somatic onset was marked in each instance by a period of fatigue. The patient looked after the children, cooked the meals, did the housework and earned the living for the family as long as she was physically able to do so. And then she angrily rebelled at the injustice of masculine irresponsibility that permitted such a situation to develop.

In none of these cases was it possible to do anything about the financial or domestic problems that had not been done by the patient except to insist that she get more rest. But each patient improved as soon as she discovered that a personal interest was taken in her difficulties and the nature of her problem was appreciated. Her visits to the dispensary or office assumed the character of an outing. She talked freely of herself to an understanding auditor. Very quickly her symptoms subsided. It was possible to liberalize the diet and discontinue medication.

The patients in this series were under observation for from one to two years. During that time, with one exception, they were returned to a general diet. Thereafter their symptoms were controlled by conversation and sedation alone.

HEALTH PLANNING

J. Howard Beard, M. D.
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The achievements of Gorgas at Panama, the success of the Framingham experiment, the records of Syracuse, New Haven, Chicago, and Evanston, the results in Rutherford County, Tennessee, and the extensive demonstrations of foundations, alone or in cooperation with states, counties, and municipalities, make discussion of health planning seem late and superfluous. Yet in many localities, health projects are conspicuous by their absence or are only in their inception. Planning is, therefore, necessary, and overdue.

As the procedures for community surveys, the organization of health units, the qualification of personnel, budget making, and methods of appraisal have been standardized by authoritative bodies—state, national, and international—and their transactions are widely known, these essential phases of health planning require only incidental consideration. Concern shall be primarily with the need, the object, and the importance of health planning and the factors which make for its success or failure.

With a gap of at least three generations between what can be done and what is being done to improve health, only intense planning can make practice equal knowledge in an ordinary

lifetime. The extraordinary rapidity of epochal discoveries in medicine in the last three-quarters of a century and the comparative slowness of their application are similar to pacing a high-powered car of today with a fliver of the "Gay Nineties."

The difference between *knowledge* on the one hand and *practice* on the other has been further increased by the fact that science has created other problems for each one it has solved for the sanitarian and physician. Every new chemical process potentially writes a new chapter in industrial hygiene. Every development in physics and engineering which modifies environment has health aspects. Every advance in biology is almost certain to have eugenic, nutritional, pathological, or immunologic implications. Progress in these sciences also produces social and economic trends which contribute to greater vigor and better adjustment, or to disease and mass insanity.

The use of steam power, the development of the gas engine, and the employment of electric energy in the mechanical arts have produced an industrial era and have changed a population mainly rural into one largely urban. This change has given rise to slums, overcrowding, smoke, dust, diminished sunlight, fumes, noise, accidents, vocational disease, malnutrition, and a better chance for he spread of infection. Marriages have decreased, divorces become more frequent, delinquency has reached endemic proportions, and birth rates have fallen until certain philosophers of doom vie with each other in predicting the beginning of the end.

The coming of the airplane, the development of submarine navigation, and the continual establishment of new speed records in the air and on land and sea have created health problems by bringing distant disease centers nearer and nearer to every home. The plague of India, the yellow fever of South America, and the spotted fever of Montana are now but a few hours removed from every fireside.

Old diseases are taking a new lease on life by adapting themselves to modern conditions. Spirochetes, pneumococci, streptococci, and gonococci are developing resistant strains which are able to withstand the attacks of the chemotherapist, the serologist, and heat treatment. Although tuberculosis has fallen from first to seventh place as a cause of death, about one draftee in every hundred in certain localities is reported to have it in an active form. Of those entering sanatoria more are in the advanced than in the minimal stage of the disease. Spotted fever is no longer confined to the Rocky Mountions, but has appeared in many states. Tularemia is common in hunters and housewives. Undulant fever, the first case of which was reported in this country in 1924, is distributed throughout the nation. Increasing deaths from heart disease, cancer, diabetes, and nephritis earlier in life are a challenge to public health administrators.

Provision of prompt care to restore those suffering from industrial accidents and disease to health and to earning capacity is far from adequate. Scientific control of the surroundings of workers is yet to be widely established. Employees are not receiving the education essential for healthful living in the community and for the maintenance of efficiency in their occupation.

Lives and health being saved by sanitation and immunization are being lost through accidents. Epidemics of injury rival those of disease. The situation is not a cause for dismay but one for intelligent planning to attain health standards equal to present knowledge.

The ultimate objective of health planning is the production of physically fit, mentally alert, socially wholesome individuals to live most in the best environment science can provide. It includes the complete eradication of preventable disease and the modification of economics, customs and culture wherever they interfere with men in the attainment of their best. The concerted action of public services to use science, natural resources and the aptitudes of the people for the common good is likewise an essential aim of health planning.

Prevention is Essential—If the value of health planning is to be measured directly as the effectiveness of the individuals of a community and inversely as its morbidity rate, optimum nutrition is paramount in the promotion of public health. The wide prevalence of dietary deficiencies, incipient, latent, and obvious, are probably the greatest cause of subnormality, defectiveness and ill health. Optimum nutrition is not only adequate water, roughage and sufficient calories, but the best amounts of amino

acids, the right carbohydrates, the correct lipoids, the proper vitamins and the inorganic salts. All these constituents are necessary to insure the highest quality of tissue, the most effective function and the greatest resistance to disease.

The insurance of the best diet is the greatest contribution planning can make to health. Such a task is as difficult as it seems simple. Customs will have to be modified, prejudices overcome, ignorance combated, fads eliminated, economic conditions improved, and education motivated as never before.

Planning also includes the widest use of well established methods of immunization. Laymen must be persuaded to support actively the program necessary to stop the occurrence of thousands of cases of illness whose means of prevention are known. Social agencies must do their part by the provision of wholesome recreation and facilities for the wise use of leisure. Economists, industrialists, employers and workers must make their contributions. Physicians, nurses, and health officials, however efficient, are not enough. The police must combat venereal disease by law enforcement. Only the combined efforts of the entire community can eradicate syphilis and gonorrhea, repress prostitution, and rehabilitate its victims.

Maternal care and the promotion of infant and child welfare are immediate objectives of health planning. Good conditions of employment are necessary in the prevention of disease, maladjustment, delinquency and unrest. The control of habit-forming drugs to reduce accidents, decrease crime, and prevent ill health is a part of a well organized health program.

Sanitation Paramount—Environmental sanitation is highly important in health planning. Safe, plentiful, supplies of good water for drinking and industrial use must be provided. Sanitary privies and septic tanks for rural areas, and sewage treatment works for municipalities are necessary to prevent nuisances and epidemics. Raw garbage must be so handled that trichinosis will not be increased, nuisances created, or valuable by-products lost. The community must not be advertised by heaps of refuse and the old tin cans it has discarded.

Community health planning is in the primitive stage until an abundant milk supply of the highest quality and maximum safety has been provided. As milk is being transported from increased distances to meet the demands of metropolitan districts, it must be supervised from cows to consumers. Food supplies are becoming more and more dependent upon long hauls for their abundance and variety. Greater precautions are, therefore, necessary to insure their quality and freshness. Refrigeration, careful handling, and rigid inspection are essental. High sanitary standards for eating and drinking establishments and good health of those engaged in the preparation and serving of food are essential in any program for community betterment.

Planning Protects—The prevalence of malaria in certain localities, the risk of the introduction of yellow fever into regions where conditions are favorable for its extension, the danger of rats becoming sources of typhus fever, Plague, or leptospirosis, and the widening of the areas in which spotted fever is endemic, make adoption of methods for the eradication and control of vermin necessary in housing, food storage, and transportation.

Planning should include ample safeguards against accidents in the home, in schools, in the factory, on the streets, and on the highways. Smoke, dust, and noise must be reduced to a minimum. In air conditioning, due regard should be given to radiation, convection, vaporization, humidity, and air movement. Heat production and loss, and zones of physiologic response ought to receive attention to prevent discomfort and extremes which may be injurious to health, or cause too great contrast between interior and exterior temperatures.

In industry, planning must make provision for periodical inspection and regular appraisal of plant sanitation to insure adequate protection and prevent the occurrence of occupational disease. First Aid should be provided and vocational illnesses diagnosed early and promptly treated. Means should be developed for the rehabilitation of workers within each organization or by co-operation between plants. An intensive program of health education should be conducted to promote health and maintain efficiency.

Social Lags Require Attention—The American way of life pre-supposes the obtainment of a well-balanced diet, suitable clothing, healthful housing, education, and moral and religious

instruction. Planning for health includes minimum standards of housing to insure the physical, mental, and social well-being of those in low-rent, as well as high cost dwellings, on both the farm and in the city.

In housing, health is inseparably associated with economics and the education of the masses. Unless these two factors are advanced concurrently with better housing, people will merely be transferred from undesirable to more attractive dwellings only to find themselves sooner or later in their previous condition. An economic, social, or cultural lag in any part of a community is a liability to all sections of it and action to prevent or eliminate it, promotes health.

Education Necessary—Health education is as essential to health planning as oil to machinery. It reduces resistance, eliminates friction, and accelerates action. By health education is meant training which modifies conduct, promotes proper attitudes, and stimulates a demand for the application of science to the improvement of the individual, the community, and the race. Health education is not merely the transference of information from one person to another, but it is *knowing* and then *doing* what is in the best interests of self and society.

Health education requires the cooperation of the public schools, departments of health, and state and federal agencies. The members of these groups have mutual obligations, interdependence, and common objectives. Their teamwork is imperative. Health education should take four directions: systematic teaching in the public schools and colleges by instructors with adequate scientific background, pedagogic training, and experience; reaching the public by lectures, exhibits, demonstrations, newspaper articles, pamphlets, the cinemas, etc.; providing "refresher" courses for physicians, nurses and other health workers; and strengthening courses in preventive medicine for future doctors.

Organization of a community for health education is in itself practical instruction in both preventive medicine and democracy. It provides a study of, and an approach to, local needs and is preferable to programs motivated by personal or special interests. The best plan for teaching health is yet to be conceived and blueprinted. Local conditions and personnel available, usually are decisive factors in determining what is accomplished. The kind of people working together rather than the means of cooperation adopted, insure failure or success. The magic words in health education are patience, persistence, and a sense of humor.

Recreation Promotes Health—Health planning should provide for recreation. The multiplication of machines, rapid transportation, and shortening of hours of work have produced leisure faster than it is being wisely used. Thousands of boys have few or no regular tasks. In many instances, they are the tragic victims of leisure before their community has a program to help them. The situation is hardly more favorable for girls. Labor-saving devices for the home, the canned goods industry, the corner delicatessen and shop made clothes leave them very little to do. They, like their brothers, have time on their hands but few plans to make the most of it. Even many parents need help to make the most of the leisure modern science has provided them.

Passive activities like listening to the radio, attending movies, riding in automobiles, or reading the funny paper, do not make leisure a means to increase vigor, promote mental alertness or produce creative thought. Recreation to improve health lies in the direction of out-of-door life, outings, sports, and games, rather than in mere relaxation which neither exhilarates nor inspires.

A simple life in the woods, nature study, and out-door exercise dissipate worries and vanish cares. The "shut-in" who participates in games and sports, develops interests outside of himself; the diffident discovers aptitudes which give him confidence; the timid finds courage and comfort in association and competition with others; the team-work essential on the trail and in the contest, develops self-discipline, self-sacrifice and the cooperation so necessary in successful living and happiness.

In planning for health, the close relation between health and recreation, the general welfare and the wise use of leisure should be recognized. Better physiques, greater agility, finer poise, and contentment,—the essence of good mental hygiene—are the results of wholesome diversion. The community should make their cultivation possible.

Environmental—Although sanitary policing has largely been assumed by other divisions of local government, health planning is still concerned with the maintenance of attractive environment. Clean streets and alleys are not only esthetic and good advertising, but a contribution to public health as a means for the control of vermin and insect-borne disease. The improvement of yards has a similar effect and sets a higher standard of living which tends to reduce sick and death rates.

Improvement of drainage removes nuisances and breeding places for malarial mosquitoes, and often provides for gardens and sports. Thus the nutrition, vigor, and health of those in the vicinity are improved. The prevention of stream pollution implies more than the sanitary disposal of sewage and industrial wastes. It increases real-estate values, adds to the food supply and provides fishing, bathing facilities, and boating for those who might otherwise not be able to enjoy them.

The creation of excellent parks is an important feature of health planning. They bring the great "out-of-doors" to city dwellers, promote happier family life and put people at ease in a world of tension and cynicism. Even landscaping, natural or artificial, may contribute to health through mental hygiene. Man still needs inspiring places where he may reflect and take courage.

Important Considerations—Before health planning can take definite shape, a group representing all the major interests of the community should be formed, a chairman selected, an advisory council chosen, and special committees appointed to study the various problems which are certain to arise. Thorough consideration must be given to the enabling acts under which the health organization may be set up, the area to be included, its population, taxable wealth and the objectives to be attained. Legally, the area must be a political unit. In some states it may be a district, a municipality, a county, a township, a road district or a combination of two or more of these. There must be adequate authority to levy taxes for full-time health work and to give the appointed personnel the legal status essential for the proper performance of their duties.

The taxable wealth of the unit should be sufficient to provide adequate funds without an excessive rate of taxation. The amount of public debt per person and the spendable money income per individual are probably the best indices for the determination of the ability of a region to support a health department. In the absence of a subsidy from an outside source, it is usually unwise to create an independent health unit unless its tax basis will yield $10,000 without exceeding an annual cost of $1.00 per capita or $4.00 per average family.

While there are special situations where it may be best to disregard this general rule, it should always be remembered that an effective program and continuous improvement in public health rarely come from an under-manned organization with under-paid personnel and inadequate funds for operation and transportation.

It is better not to begin than to start in the wrong way. The success and permanence of health organizations depend upon an adequate staff. Make-shift "set-ups" and so-called "modest beginnings" with the appointment of an individual without proper training and experience are rarely worth their cost. Very often such attempts so discredit public health work that influential citizens later refuse to give their moral and financial support to the development of a better health organization.

Disease reduction is dependent upon the use of technical knowledge. Its application in a democracy can only be most highly effective where popular understanding insures thorough cooperation, sufficient funds, and properly trained personnel. The public should not be led to think otherwise.

Factors Assuring Success—Public health work should be efficient from its beginning. Although everything cannot be done at once, each step should be in the direction of an adequate program. It should be such as to win support by showing its usefulness and the advantage of its further development.

The organization of health units is no longer an experiment, but a standard procedure. Needless expense and confusion occur only where personnel are poorly trained and inexperienced. With well-defined objectives, a complete preliminary survey and careful planning, the creation of a health unit presents few difficulties.

Soundness, not haste, is the way to rapid progress in health work. Indecision and activity without advancement towards definite goals, are failure not success. Money should be spent no faster than it can be used wisely. A well presented budget is often a means of winning enthusiastic supporters. Ill-advised and unnecessary health measures are liabilities and not assets.

A health department should be organized to do both the basic work of such an agency and to meet the special health problems of the community. Its policy should permit the use of the aptitudes of its staff. A proper relationship should be maintained with other local governmental departments and it should assist in the promotion of the health programs of the state and federal governments.

A health organization is not merely a piece of administrative machinery whose perfection insures success; it is a group of people whose training, experience and character determine its value, warrant its support by taxation, and justify its existence. Even a poor set-up with excellent personnel will prove its value, while a good organization with a mediocre staff will not be worth what it costs.

The rest of our lives will be spent in a world where thousands of men and women will be physically and mentally crippled by man's inhumanity to man. There will be many victims of disillusionment, disappointment, cynicism, and bitterness. They will be a fertile soil for organic disease, neurosis, psychosis, and social inadequacy.

In the decades which lie immediately ahead, the health planner and the health worker will be able to do much to prevent disease and alleviate suffering. They will have an enviable opportunity to promote the vigor, the faith, the hope, and the charity which are necessary for mental health and social effectiveness.

A battalion on recent maneuvers in Louisiana had been ordered to end action. It was pouring rain and the boys were standing knee deep in mud. As the order was given, one rookie piped up:

"Swell! Now let's all sing 'God Bless America' — and leave out Louisiana."

ENGINES OF THE BODY

FRANK GARM NORBURY, M. D.
JACKSONVILLE

Chairman's Address, Section on Medicine,
102nd Annual Meeting
Illinois State Medical Society, Springfield, Illinois,
May 20, 1942

Members of the Section on Medicine: You have already had a full dosage of two subjects that ordinarily I might have chosen for a talk such as this. Topics in my special field of interest, neuropsychiatry as a part of general medicine, have been discussed by experts. This morning's program on Medicine and the War appealed especially to me as an officer in the Medical Reserve Corps and as a physician.

Since we think, talk and in many ways live by mechanization at present, both in civil and military life, I decided to take up with you this afternoon some phases of the machinery of the human body. Normal and pathological physiology have interested me ever since I began the study of medicine. The response of the body as a machine, as an engine producing work, has a fascination all its own. When some disturbance arises in structure or function so that impairment of work production occurs, the "trouble shooter" i. e. the physician, is called in for diagnosis and treatment. I would not want to convey the impression that my approach to this subject is entirely mechanistic. My real opinion is quite contrary to the mechanistic idea, as I shall point out later on. The trouble is as often with the driver as it is with the machine but the driver himself or herself should know something about the mechanical principles and most certainly the repairman should and does have this knowledge.

Sir Arthur Keith, the great English physiologist, wrote a book *Engines of the Human Body*. I had found it extremely interesting at the original reading and at later reference use so naturally turned to it upon deciding to discuss this subject. Therefore, what I have to say is perhaps a review of this book rather than any original composition. When I re-read it recently part of the foreword appealed to me as being applicable to our situation now as it was to the English situation at the time the lectures, on which the book is based, were given. These were delivered during World War I, hence the

applicability of the following quotation "Just at that time more than a million human machines were fighting grimly and freely giving their lives in foreign lands that we and our children might have homes and freedom. It was a serious time then; men and women were hungry for real knowledge, not fairy stories." We feel the same way today.

One may find in the human body the whole group of expressions of expenditure of energy that are reminiscent of chapters of college physics. Mechanical, thermal, hydraulic, sound, light, electrical systems are all present.

In the mechanical group the lever, the balance, the pulley, the wheel, the inclined plane all find their counterparts in various types of skeletal structure and function. Simple levers of the first order with the weight between fulcrum and power are seen in the attachments of the skull to the trunk. The principle of the balance comes into play here too for the balance is a first order lever. Second order levers with fulcrum beyond weight are exemplified in the movements of walking where the fulcrum is the ball of the foot, the weight is transmitted through the ankle joint and the power is in the leg muscles. A more complex lever system of the third order is seen in the hand and forearm with the fulcrum between weight (the hand) and power (biceps and brachialis anticus muscles). Pulley systems are numerous in the human machine, from the small superior oblique muscle of the eyeball to the tendons of the large hamstring muscles working through the fascial layers behind the knee joint. The principle of the inclined plane is seen in front of this same joint during contraction of the quadriceps muscles, when the patella moves across this region. As for the wheel, with the invention of which transportation began, Sir Arthur Keith brings out a point I had never before realized. He states that the successive steps of man in walking or running are the equivalent of the downward and backward movement of spokes centering on a hub at the hip joint. Man has the advantage, however, over the inert wheel in that he can move his two spokes alternately, can adapt their length and angle of contact to the contour of the ground thereby being able to transport himself over terrain that not even the most ambitious jeep or tank can cover.

Heat production is an accompaniment of all forms of energy release or work. Lubricating systems, cooling systems, air conditioning apparatus are nothing more than devices to lessen excess heat production and transmute more of the accompaniment into work. Each machine has its optimum temperature of operation for maximum efficiency. The airplane motor may fail when taking off and overcoming gravity if it has not been properly warmed up. Some of us can't get going until after we've been warmed up and had the vasodilating effect of the caffeine in our morning cup of coffee as well as the warming sensation of the coffee itself. The optimum temperature of the human machine is set at 98.6 degrees Fahrenheit. How is this heat maintained, how is it regulated? These are interesting questions in thermodynamics which I am not attempting to answer for in the first place I do not know the answers and in the second they entail many other problems, one of which, climate and weather, I almost inflicted on you this afternoon in view of our having a weather station at the Sanatorium. Heat production in the body is carried out in the same manner as outside it by the combustion of carbon and hydrogen in the presence of oxygen to produce carbon dioxide and water. It is not as simple as this may sound for many intermediate processes and products arise. Oxidases and vitamins of the B group are essential for combustion. Breakdown products of carbohydrate and fat are intermediary products. "Fat burns in the flame of carbohydrate" is an old maxim of nutrition. While the flame as such is not visible the chemical reaction involved in the utilization of glucose in tissues produces heat. Protein too does its part. Chemical changes of an associated nature also produce certain molecular rearrangements in cellular structure which have to do with the function of different cell types. How the energy is set free is another question to which we do not know the answer. We do know, however, that there is sufficient heat set free in the various chemical reactions going on in our bodies to do a lot of work. In fact if it were not for the heat regulating mechanisms of the body the temperature developed in these reactions would be dangerous. One often thinks of infections for high fever, yet the extremely rapid oxidation produced in a thyroid crisis or

the change in the heat production-heat loss ratio occurring with lesions in the regulatory center in the brain can produce temperature elevations that make those associated with most infections seem mild.

Physicians and laymen lay much stress upon the heart and its diseases. They do so rightly when one considers their importance as a cause of death and disability. I would not minimize this importance. Yet I do want to remind you that on the proposition in general and on the point of view of this paper in particular the cardiovascular system, and the blood as well, are but the servants of the millions of tissue cells of the body. First we should follow up the problem of heat production and heat loss then take up the pumping station and distribution system relationships. It may be elemental, yet I think it worth while to remind you that the primitive function of the heart to pump and of the circulating system to carry the blood are more important than anything else. All our knowledge of plasma proteins, acid-base equilibrium, humoral antibodies, etc., is accessory to heat or work production and heat distribution. We speak of the need of oxygen, we use it therapeutically for anoxia of various causes. What is oxygen for except to maintain energy in the way of heat production and work on the part of the cells? We get hungry. Leaving aside the pleasurable sensations of a good meal in good company what is food for except to be digested, assimilated and carried to the cells to be stored or to be utilized in energy production? The same medium that carries these substances to the cells carries away the products of combustion and tissue breakdown. Also for our immediate subject of discussion it carries away excess heat to be used in less active heat producing areas or to be disseminated through radiation or convection. By utilization of physical principles the body as an engine develops more energy per unit of fuel than any machine devised by man.

Wiggers in the monograph "The Circulation in Health and Disease" and Sainsbury in the publication "The Heart as a Power Chamber" illustrate beautifully the application of the physical principles of hydraulics and hydrodynamics in this engine of the human body. Clinical tests of circulatory function such as the minute volume of heart output, the Schneider index, the simple exercise test are, when one analyzes them, nothing more than applied hydraulics. When I say nothing more than applied hydraulics I most certainly do not mean to minimize that important branch of physics. One of my very good friends is professor of theoretical and applied mechanics at one of our important universities. Students of his have told me that if they ever got the "hang" of his courses they knew they would never have any trouble in any other courses in engineering. I know that conversations with him have been of immense value to me in trying to learn something about the human machine. Particularly has this been true as regards the circulation. It was a natural corollary to connect Fulton's monograph on Harvey's work on the circulation with his later publication "The Physiology of the Nervous System" after such conversations and for these to serve as the stimulus for the paper I had the privilege of reading before this section two years ago on "Applications of Vitamin B_1 to Neuropsychiatry." The arrangements of the heart as a double pump together with the stream flow of the freshly oxygenated blood through the carotids to the brain constitute of themselves a wonderful example of anatomic structure meeting physiologic demand. Even if one were inclined to be mechanistic in viewpoint about certain isolated features any one most certainly must recognize something above and beyond ordinary design in this relationship. Hydrodynamics enters into the mechanism of the peripheral circulation, as well as partial pressure and osmotic pressure, for the flow of blood to the trunk and extremities, the oxygen exchange that goes on in the capillaries, the transfer of food and waste material to and from the cells the capillaries serve. Edema of the extremities with right heart failure, orthopnea with left heart failure testify to the correctness of Newton's law of gravitation when the pumping engine breaks down.

Aerodynamics enters into our thoughts and conversation in these days when the question of lack of aerial supremacy made the difference for Malaya, Java, Bataan while its presence connotes Rostock, Lubeck, the Coral Sea. Aerodynamics likewise enters into this discussion in two ways. Thousands of years ago the emergence from marine environment to terrestial existence, the

ability of animal organisms to adjust to this change, was really a greater test of adaptability for survival that that which the deep sea diver, the pig boat sailor or the aviator has to meet today. The discovery of the principle of the bellows with alternating positive and negative pressure meant much to primitive man to keep his fire going. The Great Designer had already devised and perfected that principle in making the change from gills to lungs. Later He developed for man the machinery for partial voluntary control of pressure that is tied in with the ability to communicate with his fellows, the power of speech. The capacity for articulate speech is essentially a function of the central nervous system through the larynx, the mouth, the tongue and the upper respiratory tract. The mechanism that makes it possible is a combination of air compressor and vacuum pump. This is accessory to be sure to the more imperative need of getting oxygen to the pulmonary alveoli and carbon dioxide away from them. That transfer, like the transfer to and from the cells within the body, is definitely made according to the physical law of partial pressures. Speech is important to all of us, to some more than others, but even though it is our means of communication we should remember that it is an adjunct to the main power plant that suplies oxygen to the body.

The lower forms of animal life derive their food from their fluid environment. Terrestial forms likewise get their sustenance from their surroundings. These may be near at hand, as with the cow on pasture or may cause the animal to range far and wide as with the wild members of the cat and dog family. Early man got his food where he could find it. Sometimes he too had to travel great distances as in famine times when the tribes of Israel moved out to another land. The more complex social organization becomes, the more dependent it is on transportation for essential food items. Hence the introduction of blockade, submarine warfare, the necessity of maintaining supply lines, into our daily life and our consciousness of restriction of certain items to which we had not hitherto given much thought. Transport of materials, raw or fabricated, to the individual engines of the human body, the tissue cells, is equally important for the maintenance of their individual life and that of the body politic, the body as a whole. Ours is a multiple transportation system carrying protective forces, defensive forces and all the manifold supplies to the scene of action.

Every complex social unit has to have protective machinery. Our bodies are no exception to this. They have no control over the purity of water or food supply taken other than dependence upon the care and judgment of ourselves or others. They possess, however, an efficient control mechanism for the detection, detoxication and discard of products that might prove harmful. True these may be broken down by high concentrations as with mercury, carbon monoxide or any one of many inorganic or organic chemical substances just as the police, fire or disposal units may be broken down in blitz or other disaster. Under such circumstances the special services may be out of commission. Simpler and more primitive ones have to serve. A similar mechanism is seen for instance in acute nephritis when the complex glomerulo-tubular system of filtration and resorbtion is damaged. First the intermediate system of the digestive tract as a means of elimination is brought into play with vomiting and diarrhea as a method of excretion. Finally the primitive excretory organ the skin, corresponding to the cell membrane of the individual cell takes on more of a burden with increased secretion of sweat. Hence the therapeutic efforts to supply fluids to dilute toxic products, to improve elimination, to increase perspiration.

Some physicists feel that electrical energy originally from the ether is the ultimate in simplification; that everything else in the world or in the solar system is derived from that. Whether we agree with this idea or not there is no doubt that in our bodies electrical and electrochemical changes are very much a part of life itself. The electromyogram, the electrocardiogram and in recent years the electroencephalogram give graphic records of the presence of electric currents in vital processes. There is good evidence that the nerve impulse in central or peripheral nervous system is electrical in nature. Variations in electrical potential have been studied in connection with many types of cellullar activity such as fertilization, cell division, muscular contraction. We read a scale in terms of kilovolts at a power plant or at an X-ray control table; we read it in terms of millivolts on an electrocardio-

gram or electroencephalogram. We are interpreting units of electrical energy in each instance.

A comparison is frequently made between communications mechanisms such as the telephone and the nervous system. I like to think of the latter as being more inclusive, one combining the judgment phase of the human operator with the automatic selectivity of the dial switch board. Electrical energy enters into the utilization of both. The dial system is more mechanical, more certain and more economical for ordinary messages, for integration of various engines of the social or human machine such as have been described. We know, however, that if there is trouble or if a long distance call is desired the automatic machinery cannot take care of it. The situation is too complex. Higher centers, more specialized efforts are needed. Integration must be more complete. There the forebrain is needed. In thinking of utilization of electrical energy in the nervous system the title of Tilney's book comes to mind, "The Brain, The Master of Destiny." For after all what good is the machine if it is out of control? What value has the engine if the driver cannot master it? He is part of the machine, the machine is part of him. Diversified as the engines of the body are they must be integrated to serve it as a whole.

COMMENTS ON ALLERGY

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Allergy as a subdivision of Internal Medicine is growing by leaps and bounds. The millions of sneezers and wheezers have at long last gained some attention and considerable relief. Allergy has caught the popular fancy, and is being played up for universal attention by medical writers and speakers; by radio health advisors; by syndicated columnists and even by cartoonists. The professional funny man had his innings when hay fever was considered a joke by every one but the victim himself. Now its seriousness is being appreciated, and we realize that fully 60% of all inadequately treated hay fever sufferers eventually become asthmatics. A goodly number of these asthmatic patients develop some sort of pneumonitis, the commonest of which is bronchiectasis. That now means lifelong semi-invalidism.

The profound effect of the allergic state upon the body of a growing child has been emphasized by Todd, Cohen and their associates in Cleveland. Allergy affects chiefly the shock organ, which, in asthma, is the lung, but it also disturbs every organ and every function of the body. Personality, disposition, digestion, respiration, even the growth of bones and the contour of the face may be distorted. We must accept allergy, then, as a fundamental process, not merely a superficial or trivial affection.

The concept of allergy is widening every day. Many of the phenomena of sensitivity and resistance observed in various infectious diseases are fundamentally allergic in origin. These have been studied under the heading of immunology, but are now merged in the allergy concept. When bacterial allergy has been more widely accepted as a reality, the field will be widened still farther.

There was a stage in the evolution of this subject when an allergist merely scratched, then injected, and finally just sympathized with his hay fever patients. He little suspected that migraine, asthma, eczema, colitis and many other conditions also lay within his field, and hence should be treated according to specific methods. Now we find evidences of allergy in every field. The otolaryng-ologist who does not distinguish between inflammatory disease and allergy is failing to give the best type of treatment to his patients. Every type of specialist must now take allergy into consideration in diagnosis and treatment.

The time has long since passed when a few dozen dried extracts constituted a diagnostic kit, and when a satisfying conclusion could be drawn from their use. Nor can the general practitioner of today depend wholly upon a laboratory technician for sufficient help even in the average case of allergy. I have seen a letter written by a practitioner asking a hospital technician to give his patient "the tests for asthma." Needless to say the result was not sufficient to enable a satisfactory diagnosis to be made, nor

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to form a reliable basis for the subsequent treatment of this patient. The implication of specificity is unwarranted.

An equally unscientific phase of the problem is the use of scratch tests by all sorts of irregular practitioners. It has even come to the point where the safety of certain cosmetics and hair preparations is determined by patch tests which have been entrusted to the customer for self application. Allergy has long since gone beyond the stage of scratches and bumps, and is now a complicated science, in which experience and judgment are of utmost importance. Even yet the impression is current that every scratch which is followed by a bump indicates allergy, and that a catalog of these reactions is a reliable index of sensitivities, and that a diet based upon this index is an infallible guide to health.

Many advances in allergy are being made, but time permits mention of only a few. Molds, mildews, rusts and smuts are assuming tremendous importance as causes of inhalent allergy. Many such cases of sensitivity were previously thought to be ragweed hay fever, sinus disease or just rhinitis, and disappointment followed when treatment was misdirected. Many papers on these subjects have been written, but progress had been made only by individual effort. This has been sufficient, however, to establish the validity of these bodies as allergens, and to lay the foundation for rational diagnosis and treatment.

I would direct your attention to the activities of the Association of Allergists for Mycological Investigation, a group of allergists who have been working quietly for the past three years and who have recently issued a report of their findings. There are now 31 members, scattered over the Eastern half of the United States, most of whom are now or have been engaged in the collection of data on the incidence, distribution and identification of molds. Culture plates are exposed, twice monthly, on the tops of tall buildings for two minutes, and are then sent to Dr. Marie B. Morrow at the University of Texas for identification of the molds thus collected. The University of Texas has cooperated generously in this project, and has granted time, funds and a scholarship for its continuation. Many allergists, chief of whom is Dr. Homer E. Prince of Houston, Tex., have given immense amounts of time and energy to this cooperative effort.

In this region data is being collected from Evanston and from Decatur in Illinois, and from St. Louis just across the river. Years of systematic observations will yield valuable information as to the molds that prevail at certain seasons of the year and under what meteorological conditions they may be expected. Already a large list of specific test and treatment materials and extracts have been prepared for use in the study of the molds as an important cause of human disease.

Allergy is not strictly confined to humans, as was once supposed. Dr. Fred Wittich, of Minneapolis, Minn. has described a typical case of ragweed hay fever in a dog, in which the familiar phenomena of induced symptoms and relief with adrenalin have been duplicated. A Movie film of this dog is completely convincing. Other cases have been heard of and are being investigated. It is hoped to study the question of heredity of allergy in animals by this means.

The oral administration of pollens for the relief of hay fever is still under investigation. The Chicago Society of Allergy protested two years ago against the commercialization of the method by one company, but the protest went unheeded. Many articles have appeared on the subject, and a certain amount of success has been achieved in some cases. Gastric distress has been noted on one hand and lack of success on the other. Many more trials will be needed before a final statement can be made. Obviously this method is also open to the objection that it is not likely to be preceded by an accurate diagnosis, just as is usually the case with the fixed-dose sets for hypodermic administration as prepared by various companies. The element of flexibility and adaptability of dosage is lacking in both methods, making it difficult to adjust the strength of the pre-determined doses to the individual who is influenced by various physiological states: by menstruation, by temperature, and by various meteorological variables. Failure to take these factors into consideration is conducive to systemic reaction on the one hand, or if the set is less potent, to lack of relief on the other. Obviously the oral method is not the full solution to the problem, nor may it even prove to be a trustworthy substitute for

injections in the simple cases of sensitivity to ragweed pollens.

The practise of trying to find a specific antigen with proved casual relationship to allergic disease is now well established. Treatment has been attempted by total abstinence, by gradually increasing amounts given orally, and by hypodermic and intracutaneous injections of extracts of all sorts and potencies. Results are often good in simpler cases, but have been disappointing in many instances of multiple sensitivities. Even at best the prognosis is uncertain, as the same sensitivities may return or new ones may be added. In other words the allergic background persists.

Dr. John M. Sheldon of the University of Michigan, and his associates, Johnston and Howes,* have within the year published a study on histamine-azo-protein in allergic disease. This is predicated upon the assumption that histamine is liberated from tissue cells as a result of the inter-action of antigen and antibody. The histamine is assumed to be the cause of the symptoms. Elimination of the histamine by neutralization with histaminase or by building up antibodies specifically against it have been tried, but with very little success.

Histamine can combine with protein *in vitro* to form various compounds, and these have the power to produce antibodies against the combination which would not be the case with either alone. Apparently these antibodies will neutralize any histamine present, no matter by what means it has been produced. If successful there would be produced a non-specific type of immunity which would dispense with "shots" and other types of specific treatment.

Histamine was coupled with various substances of low antigenic power, and finally with despeciated horse serum globulin (this process removing all danger of anaphylactic reaction) by means of an azo (NH) linkage. The compound contains no free histamine, but in the linked form there is as much a I mgm. per cubic centimeter.

This compound is not a panacea, but the first reports suggest the value of further study. In ragweed hayfever, for example, the results from its use alone seem to be about as good as those with pollen extracts. In Physical allergy and in cases of skin hypersensitivity the best results have been noted. This histamine-azo-despeciated-horse-serum-globulin has been used alone in most instances, but in conjunction with local remedies in skin cases. Apparently the size of the dose bears no direct relationship to the amount of relief obtained.

Several of us have been using this material in selected cases and the results seemingly justify further study and effort in this direction, in the hope of finding a really effective non-specific desensitizing agent that would free the allergic patient from his vulnerability to antigenic exposure.

*Sheldon, J. M., Johnston, J. H. and Howes, H. A. "A Clinical Study of Histamine azoprotein in allergic disease." — Journ. Allergy, 13, 18-27, 1941.

THE MALE CLIMACTERIC

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It is difficult to make this subject a topic for serious discussion, and my effort will be merely to review the recent literature and prevailing opinions; from these I shall borrow freely.

Is there such a thing as a male climacteric? If so, at what age does it occur; what physiologic changes produce or accompany it; what symptoms represent it; how may it be diagnosed; need it be treated; with what success and by what methods? These are some of the questions which one is apt to ask and which I will try to answer, using the opinions and experiences of other as well as my own.

The word Climacter is of Greek origin and means a round of a ladder. Climacteric implies a period in human life in which some great change in constitution or health takes place or is supposed to take place or be especially likely to occur. As we use the term we mean the period when sex function declines and ceases.

In the female this decline is very obvious, appearing as an irregularity and then a discontinuance of the menstrual flow and usually a termination of child bearing. Because no such striking event occurs in men, the presence of this period is doubted, overlooked, or ignored. However sex decline in men does set in, usually at about 48 years of age, and advances with

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varying rapidity, depending upon the individual. This change is usually slow and prolonged and without evident disturbance. However sometimes a typical climacteric syndrome occurs.

It is generally conceded that the symptoms of the male climacteric are not severe or debilitating but that they do lessen the patients activity, and are therefore important from a social and economic viewpoint. Executive and professional men are more analytical and hence recognize their deficiencies more keenly than the laboring man.

Among the climacteric symptoms most often experienced are:

1) Loss of force of the urinary stream.
2) Decrease of bladder neck function, even to partial incompetence.
3) Vague pain over the bladder.
4) A lowered basal metabolism.
5) A generalized feeling of uncertainty.
6) Decreased libido and potency.
7) Changes in size, shape, consistency and secretions of the prostate gland and seminal vesicles.
8) A group of symptoms very similar to those suffered by women: hot flashes, profuse perspiration, chilliness, tachycardia and palpitation on moderate effort or even in bed; emotional instability, irritability, moodiness, decreased memory, decreased power to concentrate, a desire to be left alone, depression.

These symptoms may occur frequently or irregularly, and there may be short periods of freedom interspersed. The patient often experiences a feeling of uncertainity; he is unable to make decisions which were formerly prompt and fearless. He explains that he is becoming more conservative. Fatigue is a most frequent complaint; it is more than ordinary, both mental and physical, and may follow any routine exertion. Short rest periods formerly refreshed him; now he arises tired and fatigued. Sexual intercourse is followed by marked fatigue.

The cessation of menstruation does not necessarily imply a complete loss of sex desire in women; neither does decreased gonadal activity in men lead to a total loss of potency or libido. Evidence however shows that in men a beginning decline in potency appears at about 50 years. This decreased sex power always affects a mans psychic attitude toward intercourse. In an effort to hide his shortcomings and to obscure the real state of affairs, he assumes a voluntary indifference or distaste for sex relations. This symptom of decreased libido must be properly evaluated, as it is usually one of volition, and on a mental or psychic basis.

Bladder disturbances often bring the patient to the doctor. A dull ache over the bladder and in the inguinal region, a loss of force of the urinary stream, a tendency to difficult starting of the stream, a terminal dribbling, early arising with urgency. These symptoms are present without any residual urine, with no increase in total urinary output, no lowered specific gravity, and no bladder infection.

The prostate is firm, smooth, enlarged, boggy, lacking in usual tone; there may be varying degrees of prostatitis, and the expressed secretion filled with debris, immobile spermatozoa, and frequently clumps of pus cells.

The period of life from 45 to 55 is one of attainment; at this time a man has shouldered great stresses, great responsibilities and unusual activities. These demands produce nervous and physical fatigue symptoms which are concommitant with those of sex decline and lead to confusion in differentation. Early nephritis, gastric neurosis, business anxieties, family responsibilies, cardiac degeneration, all must be differentiated, and their weight, as coexisting ailments, must be appraised.

We may receive some help in diagnosing this condition by the presence of subnormal amounts of androgens in the urine. Androgens are chemical substances extracted from the human urine, which posess pharmacologic properties similar to testicular extract. These androgens may be assayed by injecting into capons and measuring the growth of the comb. They are present in urine in varying amounts, depending upon the individual and upon his age. There seems to be a universal fall in the amount of androgens as sex functions decrease with age, and the amount found at any time serves as a fairly reliable guide to the degree of testicular activity present. Hypogonadism of whatever source may be treated by injection of testosterone, and the increase of urinary androgens found seems to parallel clinical improvement.

Much progress has been made in recent years in the study of the male hormones. A strong testicular hormone, testosterone, has been isolated, refined and now synthesized; as testosterone proprionate it is readily soluble in oil; it

is then administered by weight and by hypodermic injection. As a mixture with wool fat it may be applied to the skin. As methyl testosterone, it is available for oral administration. These last two forms are claimed to be effective but the dose must be much greater, and in the present form their use is not popular.

Testosterone is now widely used as a replacement therapy in hypogonadism and numerous reports claim it is effective in relieving nervous and mental symptoms; the relief is greater with those showing greater gonadal deficiency, and the success seems proportionate to the dosage administered, 30 to 150 mg weekly seems to give best results. As the therapy is one of replacement, the symptoms may recur as the deficiency returns. Favorable results include increase in physical energy as well as ability to sustain physical effort over greater periods of time; a greater mental ability to concentrate and to fulfill social and economic responsibility. Mental quietude and repose replaces previous irritability; the patients anxiety is lessened as circulatory symptoms improve. Benefits are not always rapid; but striking improvement sometimes follow the first few injections of the hormone. The usually accepted treatment consists of injections of 10mg twice a week for 10 or 15 doses. Larger amounts may be indicated in severe cases. The treatment should be considered one of replacement and should be discontinued as soon as symptoms abate. Over-treatment and prolonged treatment may result in unpleasant sequella.

CASE I

Professional man, age 50

About two years ago the patient began to complain of an unusual fatigue, accompanied by hot flashes and weak spells. He was under a heavy financial load, found himself unable to make decisions, and had no power to concentrate. He was treated in a sanitarium and by long periods of rest away from home, with varying degrees of improvement. Finally last Fall he was put on injections of testosterone proprionate 10 mg every 4 to 5 days. He experienced an immediate improvement and soon returned to work. At present he is receiving 10 mg every two weeks and is entirely free from symptoms. He works full hours at his office, attends to his garden and plays golf regularly. His libido and potency, which were absent during his illness, are now normal.

CASE II

A Professional man, age 51

For years he has had many responsibilities but always took care of himself, getting ample rest and relaxation. In 1936 he complained of unusual tire and exhaustion, although he had no extra duties and was getting 8 hours of sleep at night. He had an uncertain feeling on walking, and a feeling "as one has after taking a drink on an empty stomach". He was given gynergen for migrane headache, iron and vitamins for a mild anemia, but his fatigue persisted. Because of an admitted failing sex desire and low potency he was given weekly injections of testosterone. At the present time he is feeling fine, is able to do his work without fatigue and is much more calm and confident and is satisfied with his sex powers.

CONCLUSION

Some male adults show a decline in sex function, appearing at about 50 years of age, accompanied by nervous and circulatory symptoms which are mitigated by treatment with male sex hormone.

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A PRIZE FOR GOOD HEALTH. EXTENDING THE 4-H PRINCIPLES TO ADOLESCENT YOUTH

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A concept has been widely circulated inferring that our potential military man power is seriously handicapped because of physical and mental defects discovered in the course of the medical examination of selectees. This inference is based upon an erroneous premise, namely that a soldier must be a physical and mental athlete. It is implied that unless he fulfils those conditions he is of little use in the defense of his country, and is a drag on industry. Nothing could be further from the truth. On the other hand, it is self evident that every individual would have a fuller life if he had a sound mind and a healthy body. It follows as a corrolary

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that society as a whole would be benefited by his greater efficiency. It is evident that there would be fewer indigent dependents in a society in which the physically and mentally handicapped were reduced to a minimum, and it is equally evident that from such a society an army of superior men could be recruited. It is this phase of the problem of "Medicine and the War" that I wish to discuss.

It takes a cataclysm such as the present war to make us pause from our regular routine long enough to evaluate our medical and social situation. We take stock of our man power. We analyze its numbers, physical condition, mental make up, and psychic response to the stimulus of the greatest event of our generation. We have been striving to put into effect the precepts of applied Christianity, and in doing so, the medical profession has had as its sole aim the alleviation of suffering, the prevention and cure of disease, and the prolongation of life. It has cared for the poor as well as for those able to pay. The medical profession has saved the lives of many persons, but in many instances the diseases from which they suffered have left stains, some removable and others indelibly fixed. Those of us who devote our professional lives to the prevention and cure of disease during childhood, point with pride to our results. We have materially reduced illness and mortality in the first two years of life. In doing so, we have saved many valuable lives, but, on the other hand, we have also saved the lives of many children born with irremedial mental and physical defects. The pediatrician has been instrumental in increasing the span of useful human life by accepting a position of leadership in the prevention of disease. He has been active in reducing the incidence of infectious gastrointestinal diseases, small pox, diphtheria, scarlet fever, whooping cough, lockjaw, typhoid fever, tuberculosis, rickets, syphilis and gonorrhea. The crippling organic complications following these diseases often are not evident until adult life. The elimination of these diseases and their complications has removed many of the factors which in the past have prevented adults from taking their proper places in our social and economic structure. However, a survey reveals many defectives; many of these would not have survived in a previous generation, but most of them, in spite of their defects, are able to assume a satisfactory position in society. One hundred years ago, the percentage of survival of the handicapped was inestimably less, the mortality rate from diseases due to improper infant feeding was one hundred times as great as it is today. The examination of selectees by the draft boards affords an opportunity to evaluate the end results of our efforts.

After the First World War a statistical report was made by the Surgeon General of the United States Army on the defects found in our recruits. A comparison of those tables with the findings in this present group of selectees will be most interesting, but unfortunately is not yet available. If, as Dr. George Crile and others have suggested, war is the principle occupation of man, these defects seem to assume a somewhat more serious significance than that which they present during rest periods of peace. At the beginning of this war, the selection of the military personnel was based upon the presumption that every individual in the service must be physically capable of heavy labor, have the eyes of a sharpshooter, the heart, muscles and build of an athlete, unimpaired hearing, and a minimum number of natural teeth. The percentage of men who are disqualified under these conditions is comparatively large. Many of those disqualified are successful in peace time pursuits, and would be found equally useful in military life since there are many positions that can be as well filled by individuals with limited disabilities as by their more perfect brothers.

It was my good fortune to serve with large bodies of troops during the last war, and as

Table I

1000 Consecutive Draftees — August 7 to December 18, 1941

14 Local Boards

Maurice L. Blatt, M.D., Chairman

Accepted — A1 — 578

Rejected 422

A.	Rejected With More Than One Defect	84
	All Defects Correctable 41	
	One or More Defect uncorrectable 43	
	Preventable Defects 2	
B.	Rejected With Only One Defect	338
C.	Total Number Of Defects	520*
	Preventable 144	
	Correctable 359	
	Uncorrectable 161	

chairman of both a local draft board, and a medical advisory board in this one. A tabulation of the defects found in 1000 consecutive selectees examined between August 7 and December 18, 1941, is shown in Table I. An analysis of the defects presented in the table demonstrates that certain groups were preventable, some were correctable, but others must be classified as either unpreventable or uncorrectable or both. Of the 1000 men examined, 578 were accepted and 422 rejected; 338 because of one, and 84 with more than one defect. One hundred forty-four of the defects found were classified as preventable, 359 as correctable, and 161 as uncorrectable.

Table II

1000 Consecutive Draftees — August 7 to December 18, 1941 — 14 Local Boards
Maurice L. Blatt, M.D., Chairman
422 Rejections

	Prevent	Correct	Uncorrect
Abd. Wall	2	24	2
Heart		6	51
Bld. Vessels		16	1
Cord			9
Brain	1	1	10
Nerves		1	1
Ears	15	13	19
Eyes	1	119	15
G.I.	2	9	1
G.U.	19	27	8
Muscles		1	1
N & T		1	
Bones	1	7	18
Joints	5	10	19
Skin	1	3	2
Teeth	38	47	
Lungs	22	28	1
Syphilis	4	4	
Thyroid		5	1
Weight	33	35	
Others		2	2
TOTAL	144	359	161

In Table II, the incidence of the preventable, correctable and uncorrectable defects is shown by systems. Many of these defects are both preventable and correctable. The largest number of preventable disqualifying defects was insufficient teeth for satisfactory mastication. An increase in dental care, mouth hygiene, and proper diet would have prevented this disqualifying factor. Thirty-three were disqualified because of irregularity in weight. Most of these were very much over weight, an easily preventable factor. Twenty-two had preventable lung findings. Among the correctable defects, poor vision due to errors of refraction lead the field with 119 instances. These men could be brought up to a useful standard with suitable lenses; not the high standard needed for field service in the army, but more than adequate for a clerical personnel either in the army or in industry. Army standards should be altered so that this group could be accepted for limited service.

Based upon a medical survey such as this, it seems logical to conclude that an effective plan for reducing, and, if possible, eliminating the incidence of preventable and correctable defects is needed. It should be a part of our school curriculum.

In a recent article on Medical Economics, Packard[1] states, "medical care is an essential part of our social and economic structure." Wright[2] at a meeting of representatives of the Boys' Clubs of America, calls attention to the fact that, "There are no priorities on health, and it is an easy commodity to sell in any community that has the interest of its future citizens in mind." Tooley[3] at the same meeting, advocated the institution of; 1. Health Service, defined as an early physical examination and a follow up service to insure the correction of remedial defects by the family physician or social agency responsible for the child; 2. Health Supervision, the detection and elimination of undesirable environmental factors; and 3. Health Instruction.

The Children's Charter, adopted at the White House Conference on Child Health in 1930, advocates, "Health protection from birth through adolescence, including periodical health examinations, and where needed, care of specialists and hospital treatment." Hiss[4] advocates following the 4-H health program. The plan consists of (1) Health Education, (2) Health Preservation, and (3) Health Restoration. "National Health Scorings" are presented each year at the National 4-H Meeting, held in conjunction with the International Live Stock Exposition in Chicago. The health score cards were devised for the 4-H Club by the Bureau of Health Education of the American Medical Association, and the Elizabeth McCormick Memorial Fund. The 4-H Clubs are active in rural

communities, and the Boys' Clubs of America are active in the cities. The Boys' Club "Health Manual" may well serve as a guide for any organization.

The Y.M.C.A., the C.Y.O., the J.Y.O., the "Scouts," and numerous organizations based on racial groups are interested in athletics. Many of them have provision for health supervision. The medical profession must encourage a broadening and deepening of this interest.

The acient Greeks stimulated interest in the development and maintenance of health through organized gymnastics. Hippocrates, in 400 B.C., improved the system which Plato had stressed previously as a necessity in the training of the Greek youth. The ancient Teutonic race were equally interested, and until the end of the Middle Ages, athletic meetings were common in Great Britian. An active revival of interest in gymnastics under the leadership of F. Ludwig Jahn, "Father John," occurred in 1811 in Prussia, and in 1813 in Sweden under Ling. Father John's Turnerplatz formed the background for the Turn Verein which played an important part in early American physical culture.

In the United States, we have been prone to take our gymnastics vicariously. Antagonistic team competitions such as base ball and foot ball attract large groups who sit comfortably and watch a few athletes at work. Competitive mass gymnastics should be reintroduced into our public, private and parochial schools. This should be preceded by a physical examination of the students, carefully conducted, using a standard form for recording. Parents and the family physician should be informed of the need for corrective measures. Later the family physician should be contacted and asked for a report on the child's health. Provisions should be made for the medical care of the indigent and for other children without a family physician.

Mass gymnastics is followed by improvement in physical development. Competition between large teams needs to be developed, first within the city and then nationally. Fitting exercises would prevent many postural defects. Physical examination would reveal many children with carious teeth, hernias, and similar remedial defects. After their correction, these children would join the gymnastic group. Children enjoy displaying their physical prowess, and with very little encouragement this movement would popularize itself. Many individuals now negligent would become health conscious.

The school gymnasium must again become the center of a health program for the children of our nation. The responsibility for the institution and success of this program falls upon the shoulders of the medical profession. It is our duty to advise our children and the members of our school boards, individually and collectively, in matters of health. The public and the government are interested, and the time is opportune.

CONCLUSIONS

1. One thousand consecutive selectees were physically examined by my Board between August 7, and December 18, 1941.
2. Five hundred seventy-eight were classified according to the U. S. Army standards, as A1; 422 were rejected.
3. There were 520 defects found in the 422 rejected applicants. Three hundred fifty-nine (69%) of the defects were correctable by medical and surgical means.
4. A uniform and systematic physical examination of all children in public, private, and parochial schools is needed in order to correct these defects at an earlier age.
5. Mass gymnastics preceded by a yearly physical examination should constitute a part of the curriculum of all schools. This will stimulate interest in health problems.
6. When defects are found, parents and guardians of children will be notified. The family physician, or public agency responsible for the institution of remedial measures, will be contacted and a progress report requested.
7. The health of the individual will be improved, and the industrial and military strength of the nation increased by the institution of systematized gymnastics, physical examination and corrective therapy.

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SOME VISUAL PROBLEMS IN MODERN INDUSTRY

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The physical requirements that Industry of necessity sets up for it's human staff to meet, are rapidly changing and are increasingly seen to be akin to aptitudes of mind and body. Visual performance is being scrutinized in Personnel and Training Departments. It has taken a prominent place in the study of production statistics, and of course, is very important in reducing accidents. Visual deficiencies make for awkwardness, and an awkward man is an unsafe man. We saw very early that the concept "visual performance" or "Eyes for the Job" and the acquiring of information relative to the binocular visual machinery had to supercede the notion of merely recording acuity. It was because this was practically untrodden territory that we had to set up our whole research project dealing with the appraisal of vision in industry.

On the basis of the data secured from the original survey of 16,000 men, we set out to define and evaluate the several factors pertinent to visual functions and its relationship to Industry. Other surveys and studies adding new types of problems now total some 25,000 to 30,000. New spearheads, new ideas and objectives have emerged. Further work is now being carried on by interested collaborators and the channels go in many directions. There have been some rather startling explosions of supposedly solid concepts and some very timely applications to our war production.

New developments have arisen for several reasons: 1. Through the application of basic statistical, analytical methods, to the problems involved (a procedure not commonly used by the medical profession). 2. By combining the ideas and methods of industrial psychologists with those of a purely medical analysis. — (It has been amazing to discover how much more effectively one can escape a dead end by careful mathematical checking). Conclusions reached where vital contributing factors have been overlooked often serve to nullify endless days of work. 3. By winning the whole hearted interest and support of Management who not only opened the gates of Industry but frankly laid their actual problems and specific tangles before us at which to work. We kept our feet fairly well on the ground. It is one thing to develop a theory in one's office or laboratory and foist it onto Industry; it is another to sit down and solve "on the spot" the actual needs as assigned to us. This is exactly the way a chemical or engineering "problem" is turned over to the Research Laboratory of an industry. I believe these challenging requests for help here, there, and everywhere, in every conceivable type of industry, have given us a decided advantage. They have served to sharpen our focus, to give impetus to the effort, and to channel the work towards essentially practical and immediate ends.

Everywhere in Production, in Government organization, in present and future urgencies, and rightfully in Medicine, it is no longer WHY but HOW. We have no time to use our former slow plan of "Ivory Tower" cogitation and spend hours or days in studying; although we fully realize that we shall make many mistakes, which later, less hurried research will correct. We must seek every conceivable technic to do better. We must try to keep an open mind in interpreting and appraising. The pragmatic test of "will it work" has for the time being forced the reluctant clinician to waive his "500 cases set up to prove this." And, his year long contemplation of a drug's action is often impossible. Try it now! In this way did the Medical Staff at Pearl Harbor proceed, and the results of their bold plunges into mass use of the sulfanilamides etc. saved many. In one immense step — action at the front — new ways, not theories were revealed, and the results were startling.

Speaking more specifically of our assigned topic, three special items need to be considered. Too long there has been an unrecognized gap between the eye man practicing clinical ophthalmology in an industrial community and the eye man adding to this clinical knowledge, a true comprehension of the industrial ophthalmological tangles involved. This additional service must cover a field for which industry itself makes its own blueprint of needs and desires. (In this entire discussion, I am not referring to the care of eye hazards or the field of eye acci-

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dents, etc.) May I here make a very harsh but realistic statement and underscore it heavily. Industry cannot use now, or ever, in the light of the developing scope of service, an Ophthalmologist (except as surgeon and compensation consultant) who does not actually enter the plant and make himself thoroughly familiar with the varying patterns of those industries he is responsible for; who does not study each and every job, distances of work, physical environment, and the necessity of judging space relations. Then he has the task of classifying this information for himself and management into simple job groups as related to visual requirements. It might well be asked, "How does industry specifically need the knowledge and services of an Ophthalmologist in these other fields of visual skills?"

1. Industry needs its ophthalmological consultant to set up for it and its general medical examiner; (if it has one) standards — visual of course — for (a) the selection of employees, (b) the placement of employees. This is a comparatively simple but extremely useful service now that we know something about the variables of visual functions.
2. The Industrial Ophthalmologist must teach preemployment examiners a battery of convenient but adequate visual performance tests in the light of the demonstrable relationships between visual factors and job performance. Later, when the new instrumentation is available, technicians will be specifically trained, perhaps even certificated, in order to keep the entire program under control, and scientifically accurate.
3. The Industrial Ophthalmologist must, for instance, find that spot in a given plant where a color blind person can work as safely and as efficiently as one who is normal in this regard. We must place other applicants with various visual defects in job niches where they can serve effectively and safely.
4. The Industrial Ophthalmologist must discover and cull out for special attention, those jobs that require operators with perfect binocular function no phorias, no serious lack of stereopsis — both for safety's sake (crane operator) and for efficiency's sake. (Inspectors)
5. The Industrial Ophthalmologist must spend time studying special close jobs, so he can really select and evaluate close work jobs — inspecting, threading almost microscopic apertures — checking calibrating instruments, etc. where special reference to efficiency and accuracy is vital.
6. The Industrial Ophthalmologist must perfect and standardize near point tests on which now so critically much depends.
7. The Industrial Ophthalmologist must correct the visual refractive errors of the industrial employee-patient, for his job-needs during his working hours. If necessary, he can be corrected differently for his non-work hours (example — myopes in 8" looping job in hosiery industry).
8. The Industrial Ophthalmologist can through an acquired knowledge of statistics and their application to production analysis, demonstrate to Management the direct relationship between visually carefully selected operators, their production capacity, and their accuracy.
9. The Industrial Ohpthalmologist can show industry *also* how to rehabilitate, improve and train the ineffective workers already on the payrolls, and how to prepare applicants in a world of tightening labor markets. — (Occupational glasses, orthoptics, correction of distance refractive errors; use of hardened corrective goggles instead of cover-alls; study of glare factor (occupational polaroid): eye fatigue due to secondary anemia; hypothryoids; foci of infection, etc.) Orthoptics under the pressure of the war danger has stepped out of the world of only training grade school children with squints into one of putting a crane operator back on his crane, or a flyer into the air. If you give your patient a careful physical check and look for — teeth, sinuses, poor breathing due to deviated septum, nasal allergies, low hemoglobin, low blood pressure, over or under weight, nervous fatigue — and correct any or all of these, you will find orthoptic training is a very satisfactory and important part of your work, designed to meet the requirements of occupational visual skills.

These are a few of the ways that the Ophthalmologist practicing in an industrial community can and must serve the interests of Industry directly in addition, of course, to his meticulous care and study of each and every regular private patient whose eye health is now so vital and who is in need of potential skills.

One very fascinating offshoot has grown out of the original blueprint of evaluating visual factors in industry — and that has been the final complete explosion of the idea that one is or is not color blind. Professor Tiffin is to read a paper based on some of our data on color discrimination in Industry before the ophthalmological section of the A. M. A. in June. Briefly, we found four levels of difficulty; color vision (like acuity) is seen to be a matter of degree, both qualitatively and quantitatively. And, by this new angle we demonstrate the difference between using the statistical approach to individual differences and the physiological picture

itself. Therefore, a scale of color *appreciation* (not of color blindness) is important in the selection of employees for some jobs — example, the man who expects to be given a five to ten year training in order to do color printing needs to be chosen from the very highest levels of color appreciation. The tractor driver who needs only to be able to recognize red and green signals can be picked from lower levels. The need for a *graded* color test (which is now being developed) is very important. The inclusion in the employees visual record of a more exact estimate of color appreciation is indicated even where the importance of color is as yet, not easily demonstrated.

It became apparent, both throughout the entire Research Project itself, and as revealed later by the innumerable consultations and problems handled by the Joint Committee of Industrial Ophthalmology, set up by the A.M.A. and the Academy of Ophthalmology and Otolaryngology, that there is both a great need for establishing standard eye tests and methods of procedure in evaluating industrial efficiency, — and a great need in providing the framework for their use. There must be a clear-cut program for the application and interpretation of tests and procedures. There must be, of course, continuing effort by all interested and capable scientists studying vision. The members of the Joint Committee have been making Herculean efforts under the leadership of Dr. Snell and certain basic facts have been agreed on, namely:

1. The absolute necessity for a scientifically accurate *battery* of tests for appraising the visual skills of large numbers of employees; such tests to be made in the plant and applicable to the specific visual demands of each plant. The record in each instance must include:

   distance acuity, (with and without glasses)
   color discrimination,
   muscle balances for distance and near,
   stereopsis,
   near point tests, including N.P.A., N.P.C. acuity

   In our opinion, the tests must be based on a technic that is standard and fool proof, and achieves reliable recording. No present single instrument fulfills the requirements of the Committee. The new Bausch & Lomb instrument as developed to date, seems to meet our requirements.

2. The Committee emphasized the need for learning how to incorporate the use of statistical and analytical methods in the study of efficiency. This, so, that both Management and the Industrial Ophthalmologist can *know* and not guess, that their program, refractive correcting, establishing of do's and don't's, have a factual basis.

3. The Committee recognizes the urgent need of breaking down purely arbitrary visual employment requirements (even to the extent of trying to educate the Insurance Companies and compensation courts). In Dr. Snell's words, taken from his fine paper, "Sub-normal Vision and Occupational Aptitude," "Visual aptitude depends primarily on the nature of a specific job and the minimum degree of visual efficiency required for its effective accomplishment."

4. We have also seen the need of establishing a much closer working tie between Management and Ophthalmology. The doctor has a second college education before him as he unravels the headaches of Management and the troubles of the employee, but he is rewarded by an appreciation of the complexities of that fascinating world — Industry.

5. And, last, because it requires special emphasis here and must be developed for a moment, the Committee found an amazing laxity in the use of near point tests as a routine procedure. It also found that the technic used by the profession in the field of near point examinations was inaccurate. The setting up of more rigidly standardized *near* point tests, which does *not* necessarily mean *special* equipment is important. Much can be done with simple procedures. Near point tests are a very great weakness in the routine technic of the eye doctor today; such a weakness in the presence of the vital problem of close work in industry is especially dangerous. Near point tests should include in order of importance;

1. *Near point of Acuity* — Near point of acuity measured as by three principle methods; ("Jaeger"), (Diopter or Meter), and (Snellen at 14").

2. *Near point of Accommodation* — Near point accommodation should be measured, right eye, left eye, both eyes — and difference in right and left measurements should be accounted for. The Prince Rule or even simple push-up methods are satisfactory. (letters to blur)

3. *Near point of Convergence* — The push-up method is used mostly — the targets may be any small (about 5 m in diameter) object requiring some accommodative stimulus, the normal break being about 3" or .8 centimeters.

4. *Phoria* — Many methods of phoria measurement — (cover and parallex where patient notices movement) are satisfactory if no special equipment is available or one can use the special slides in the new binocular instrument when it is available.

5. *Ductions* — (Prism Convergence and Divergence and Positive and Negative relative accommodation. (Difficult to get accurate measurement without special equipment).

Any marked deviation from the normal in any of the above tests may be the basis of visual disturbance — unless lens Rx improves these findings. The ordering of this lens Rx in itself may be of little value in correcting the difficulty.

SUMMARY

The Ophthalmologist practicing in an industrial community; and especially those eye physicians acting as consultants to war industries, have an immediate responsibility — to roll up their sleeves and work with Management *inside* the gates of industry; to bring to the war effort the latest understanding of visual safety and efficiency; to designate the choice of manpower and it's effective placement; to study production results and unearth new unsuspected relationships; between eyes and accuracy; to think and work *hard* on modernizing the present loose technics of the near point tests; and finally, through realizing all of the above objectives, to add immensely to the all too meager information that Ophthalmology in general now possesses in the field of visual performance. In so doing, we can make our contribution to the War effort at home by serving Industry, the greatly augmented clerical staff in government offices who work under such high pressure, and by preparing men to meet the visual requirements for Service in the Armed Forces.

GRADUATE EDUCATION IN NEUROPSYCHIATRY
A PROPOSAL FOR A CHICAGO PLAN

ROY R. GRINKER, M.D.

CHICAGO

A presidential address is usually a chore to write and a punishment to hear. Yet I, especially, feel in duty bound to maintain this society's tradition, since it was revived in 1926 by my father, Julius Grinker. Presidents are expected to look backward with sad sentiment upon the glorious productive past of their specialty, view the present (especially its economic features) with alarm or predict the accomplishments of the future. Some renounce past attitudes as when a neurosurgeon becomes a neurologist but I have already published my own apologies, on graduating from the strict isolationism of organic neurology to dynamic neuropsychiatry. Truly I have been grateful for the honor and privilege of presiding at your meetings this past year and as a last perogative I beg your attention to my thesis this evening. It concerns a practical matter, long latent in my mind and struggling for utterance. — *"Graduate Education in Neuropsychiatry — A Proposal for a Chicago Plan."*

Not quite a decade has past since a veritable deluge of special articles appeared in our periodicals under the title of "The Training of a Neurologist." Walshe, Brouer, Penfield, Riley and Hunt, by invitation, presented orthodox points of view. These articles with their wishful attitudes and exhortive note were indicative of a difficult and perplexing age for neurology, only recently severed from its umbilical attachment to internal medicine and psychiatry and already confronted with intense sibling rivalry. Neurologists were severely threatened even then, for Riley mentions that infantile paralysis, syphilis, blood dyscrasias, convulsions and psychoneuroses were in danger of being separated from the specialty. This threat has become a much greater reality since, in addition, all infections of the central nervous system, vitamin deficiencies, neoplasms, autonomic disorders, traumatic conditions, psychosomatic problems and a host of

Read as the Presidential Address before the Chicago Neurological Society April, 1942.

other categories have been, at least partially, taken over by others.

To survey the field of clinical neurology with the attitude that we should circumscribe what belongs to us by virture of arbritarily staked off prior claims is a grave mistake. It is useless to decry the raids made upon our pastures by bandits from bordering specialties. Infectious diseases, syphilis, neoplasms, etc. of the nervous system are diagnosed and treated by others who will continue to do so as long as they function in some manner better than we. Every loss from our field has been with good and proper justification. Others have advanced the investigation and progress in diagnosis or treatment, their practical therapy has been more efficient, or they have given promise by more optimistic attitudes that therapeutic results may be achieved, although not always produced. Often we have completely neglected the subject that we claimed as our property. Whenever problems arise in our lost domains that require our investigation, skill in diagnosis or rational therapy be sure that we still participate. There is more than enough for all of us to do and much that needs painstaking observation and investigation. Someone has erroneously stated that divisions of medical specialization are based upon technical advances in therapy. If this were true, medical neurology in its adolescence is accused of being a still-birth.

Instead of the aforementioned proprietary attitude a reasonable survery of neuropsychiatry should anticipate breaking down existing barriers, destroying the fences surrounding the specialty and determining what nurture may be interchanged with tangential fields of biology and medicine. The era of isolated scientific disciplines has long since past, obvious to those who have followed the progress in the physical and biological sciences. Likewise in neurology, anatomists are engaged in physiological research, neurosurgeons become neurologists, neurologists turn into neuropsychiatrists and psychoanalysts become social scientists, etc. The fact is that neuropsychiatry has ramifications in all of medicine and biology but its channels for interchange of ideas back and forth are too shallow and need deep dredging. Certainly sharp divisions and restricted subspecialization within the field of the nervous system are evidences of provincial mentality and are handicaps to the development of science.

My thesis is cogent to the cause of good teaching. A sound training in neuropsychiatry, whether the product considers himself neurologist, neurosurgeon, psychiatrist or psychoanalyst, must be broad and long, extending from the secure foundations of general and special biology to the lofty towers of psychodynamics and social science. By the very nature of its territory it must reach out into all of medicine on one side and psychology on the other. It should occur to those who preach for enloculation of the specialty that the stuff it deals with — the human mind — is impossible to circumscribe. Sound training, furthermore, cannot be limited to the small group who deal exclusively with the nervous system; it must be extended to all the tangential fields. Graduate teaching entails the larger responsibility of indoctrinating all those who delve into neural lore with sound principles and tenable theories of neurology. In so doing we lose nothing for our specialty and gain everything for science.

The era of perturbation regarding the training of a neurologist of which I spoke saw the initiation of a licensing board of neurology and psychiatry. This was opposed by the isolated voices of a few whose weak protests gradually have been stifled by the practical will of the majority. A licensing board or examining body set up for the purpose of accrediting doctors or specialists passes on the results of their general and special education and advanced technical training. Danger lies in the fact that the board's preconceptions of standards may so influence educators concerned in advanced training that a regimented rigid system of graduate training becomes fixed by implication. The late H. Douglas Singer once told me with great pleasure that many medical schools had approached members of the Board of Neurology and Psychiatry for advice and detailed specifications regarding courses for potential neuropsychiatrists. The inevitable result is the achievement of a minimal standard, laudable to be sure, but also an unhealthy regimentation and a restriction of brilliant students because of the premium placed on special examination. Higher and specialized education predicates a stage beyond the spoon feeding of undergraduate teaching with specifi-

cations regarding type, content or time involved in courses of training. A reasonably intelligent examining board should be able to determine proficiency without imposing sterile stereotypy. A supine attitude of educators regarding the boards will facilitate the control of graduate education passing into the hands of those who set minimal standards rather than those who are on the advance lines of progress. Without denying the advantages of some system of maintaining minimum standards I am skeptical of the ultimate value of the licensing board for progress in the field; instead I suspect a restraining influence. I strongly urge a system of advanced training which although satisfying board requirements, rises above them.

In the first three decades of this century graduate education in neuropsychiatry flourished in European countries. Many mature goal-directed graduates of medicine made pilgrimages to the medical centers of Vienna, Berlin, Paris, London and Amsterdam to study under famous masters. In small groups or as individuals they organized didactic courses or demonstrations in which a Professor taught the essentials of a phase of his subject in which he had attained proficiency, established new methods or evolved new ideas. Then on to another phase of the work under another master, perhaps in another city or country. The student could work in laboratories studying anatomy or pathology, perhaps beginning research in the field, or he could write histories as a hospitant or clinical clerk. The mature student was able to get an introduction to his specialty from authorities of its separate aspects along with his reading and studying. Personal experience could come later at home and with time. These students were not regimented by rules of so many hours, so many months or by group work in large classes geared to the pace of the slowest. These men were not hampered by mediocre instructors or neglected by divided attention of teachers harrassed by other responsibilities. The students were mature enough to choose and judge their own teachers. The majority of neuropsychiatrists of note and standing whose training occurred before 1930 are the products of this past glory of European post-graduate education.

In the last ten to twenty years neurology, neurosurgery, psychiatry and psychoanalysis have risen to heights in the United States that made educational pilgrimages elsewhere unnecessary. In fact the flow of students reversed itself; Europeans and South Americans came to our shores for special study in neuropathology, neurophysiology, neurosurgery, etc. How was it with our graduate education? Did it develop apace with American scientific progress and the calls made upon our teaching resources? It simply did not develop to meet the needs of our own students much less those who are attracted from other countries. Isolated laboratories, hospitals and universities attracted a few students for special work but an adequate survey of the entire field can be obtained with much difficulty and only at the cost of much time. Only the University of Pennsylvania Graduate School can be indicated as a successful venture largely because of its recognition of the necessary extensity of sound education even within a specialty.

In 1934 Bailey wrote of our combined venture at the University of Chicago. There he and I had fused our laboratories and clinical services and established graduate training fellowships each lasting three years. The first year was mainly for laboratory studies in anatomy, physiology and pathology, the second year essentially for medical neurology and the third year for experience in surgical neurology. There was no rigid separation of activities and for the entire three years the teaching facilities of the entire division and the whole university were available to the student. There were aspects of this special training that were not adequately taught and some students simply endured medical neurology for the privileges of the operating room. Yet we remain justifiably proud of our products.

We were not the only nor the first group to establish such general training fellowships for several hospitals and universities established similar graduate training before us and since. The degree of Doctor of Philosophy is sometimes held out as an incentive for thorough training. The fellowship and/or residency system has the great advantage of extensive clinical experience because the student is usually employed for ward, clinic or operating room assistance in

exchange for his tutelage. Its disadvantages are due to the fact that laboratory and clinic are often temporarily separated, the residence in one hospital or clinic results in an incomplete training, often narrow and sometimes biased and the student becomes indoctrinated too early against other points of view. Even though the fellowship is in a university environment the student does not have contact with as many aspects of his field as he should, for in no single institution are all phases of that specialty represented, much less well represented. His point of view will be permanently biased by the particular attitudes, prejudices or so-called school of his teachers. Often a graduate of such a course not only thinks but talks and dresses like his chief by virtue of the well known psychological mechanism of identification. The long residencies indoctrinate the student with provincialism and stifles the broad point of view.

Another defect is the teaching of various aspects of neuropsychiatry each isolated in departments separated by physical walls and by time. To best illustrate this problem I shall digress to certain experiences in undergraduate teaching. At the University of Chicago I taught neurology to third and fourth year medical students. They had been given courses in comparative neuro-anatomy and neuro-embryology in their last year of premedical work, neuro-anatomy had been taught in the first year of medical school and neurophysiology in the second year. Their teachers you would agree, were quite capable; yet when the students came to me they remembered little of their previous contact with neurological fundamentals. It was necessary to repeat the anatomy and physiology related to each portion of the nervous system when disease of that part was discussed. The fault obviously lay in the temporal dissociation in the teaching of anatomy, physiology and elementary clinical neurology resulting in a complete absence of integration or sense of wholeness of the subject. At our neurological society within the University I discussed this difficulty and suggested that in teaching neurology departmental lines should be broken down, that function should be taught as structure was learned, and disease with both by means of simple demonstration of physiological preparations and carefully selected clinical material. The answer was a rejection on the grounds of departmental barriers. My interest in the subject of integrated teaching stimulated me to write a "Neurology" for the purpose of facilitating such a method of teaching. I did not succeed in my purpose to the degree I desired; yet it has been gratifying to know that in continually increasing numbers of schools teaching from this book is begun in the first year along with the study of neuro-anatomy. Fulton's "Neurophysiology," Brock's "Basis of Clinical Neurology" and now Krieg's new "Functional Neuro-anatomy" have since become valuable additional aids for the teacher of integrated neurology.

Where in this country can we establish a center for the integrated graduate teaching of neuropsychiatry based upon broad and rational concepts free from bias, provincialism and regimentation and inclusive of all the necessary basic, auxiliary and correlative subjects for a thorough knowledge of the specialty? I think we have every reason to believe that such a center can be established in Chicago. You and I are prejudiced it is true, but I fail to see that any other large medical center has the capacities for the task of graduate education that we have here. In brief we have the human power in the shape of men of excellence in research, teaching and clinical skill who represent every aspect of the field from neuro-embryology to psychoanalysis, in other words a range and variety of view points that is catholic when considered in its entirety. We have the institutions that include every laboratory facility and quantities of clinical material in each aspect of neuropsychiatry, second to no other city.

Perhaps you may be skeptical that a city-wide graduate school can be established because of the difficulty of getting men to work together, for such an ideal which must of necessity rise above the personal. You may point to your disappointment that a medical faculty failed recently to accept an opportunity to further graduate education within its own walls and failed to grasp the possibilities, suggested by Fishbein, of leading a larger venture within the city.

In our field we have leadership and we have capacity to work together proven many times by the splendid functions performed by committees with whose work you are all familiar.

The Psychiatric Research Council of the State of Illinois proved that men could submerge their individual desires for a common ideal and work toward a common goal. You have the University of Illinois Neuropsychiatric Institute as a result. The divergent attitudes and contrary points of view that exist in the leaders of neuropsychiatry in Chicago are healthy and an absolute necessity for a broad graduate training. They do not cause personal or political enmity too great to be bridged over by the common interests of pedagogues and I have complete confidence that no differences existing among Chicago Neuropsychiatrist are important enough to consider as obstacles to a cooperative venture in graduate education.

When shall we organize graduate teaching and does not the war obstruct all innovation and even restrict already organized activities. I believe this is the time to begin our experiment just because there is a war. We should organize our curricula and be prepared for the large numbers of men who must delay their specialized training because of army service. After the war an accumulation of graduate students will swamp the already established training institutes. The time is propitious for another reason which is more immediate and practical. The armed services will need neuropsychiatrists in increasing numbers, far more than are now physically fit and available. The impact of this necessity will be felt only when neuropsychiatric casualties return to this country after offensive fighting has become more intense. The history of the last war discloses the fact that organization and mobilization of neuropsychiatric services is relatively late. There will be a hasty call for the rapid development of specialists so that refresher and introductory courses will be required. For our purposes, however, this necessary activity will be of value only as a springboard from which to leap into real graduate education in neuropsychiatry later.

Let me list the assets of the Chicago center of neuropsychiatry without mentioning names of individuals. There are four class A medical schools with hospitals attached. We have at least half a dozen independent hospitals, including the Cook County Hospital, with thriving departments of neuropsychiatry. There are in addition special hospitals and institutes such as the Institute for Juvenile Research, Illinois Eye and Ear Infirmary, Institute for Psychoanalysis, etc. We have museums of clinical neurology at Oak Forest and of clinical psychiatry at Chicago State Hospital and Elgin. Let me list the separate activities within our field and as I enumerate the ten divisions recall to your mind the investigators, teachers and clinicians who represent the available personnel in each.

I Morphology { Comparative neurology; Neuro-embryology; Neuro-anatomy }

II Physiology

III Pathology

IV Clinical Medical Neurology { Child; Adult }

V Clinical Surgical Neurology

VI Clinical Psychiatry { Child; Adult } in { Clinic; Hospital; State institution }

VII Psychoanalysis (Psychosomatic Medicine) { Child; Adult }

VIII Laboratory adjuncts { Serology; Roentgenology; Electroencephalography; Psychometrics; Rorschack }

IX Cooperative specialties { Urology; Otology; Ophthalomology; Endocrinology; Blood dyscrasias; Deficiency states } Internal Med.

X Environmental factors { Social agencies; Social services; Sociology }

Bringing them all together you will agree makes a composite faculty which is representative of many divergent points of view, in some aspects with brilliant leadership and in general an outstanding group. Such is the stuff out of which a Chicago plan can be developed.

I envisage that graduate teaching of neuropsychiatry in Chicago may be classified under three headings:

1. Training for specialization in Neurology, Psychiatry or Neuropsychiatry.
2. Training of specialists in other fields such as ophthalmology, otology, etc. where certain advanced work in neurology is necessary.

3. Teaching of general practitioners and internists in general principles of neurology and psychiatry.

The functions included under the second and third heading although extremely important may be quickly disposed of. They necessitate increasing our activity in participating and cooperating with teachers of other field and establishing certain general courses and seminars in our existing teaching institutions for the non-neuropsychiatrist. We have much to contribute and in the sphere of education our reward will be ample by a reciprocation of teaching interest on the part of the cooperating and auxiliary specialists whose services we will need.

No one man can sit at his desk and envisage a procedure and nobody can anticipate the difficulties which this plan will encounter. For the sake of this exposition let me sketch a quite tentative arrangement.

1. All the existing facilities of the city will be investigated and evaluated as to the physical capacities, the personnel, the time available and the likely cost to the student. It may be mentioned that each institution should be re-imbursed for cost of material, equipment and salary of teacher by fees paid by the students. Actually the fees will be reasonable because the graduate school will not have the overhead costs of its own physical equipment as in Philadelphia. It is hoped that a central or isolated institution to house the school will not be contemplated for the heart of the plan consists in scattering of the students into the individual institutions in which divergent points of view are represented. Such a school must continue to promise an electic rather than sectarian attitude.

2. A central committee of preceptors will interview each student coming to the Chicago Graduate school and on the basis of a personal knowledge of the individual, his goal and time available to him, plan his own individual curriculum. As time goes on and the plan is successful a full-time Dean of Students may be employed. The student will be sent to appropriate laboratories, classes, clinics and hospitals to enjoy a well considered and rounded education depending upon his special interests and abilities. Reports may be sent to the committee regarding his progress. Advanced degrees may be given under appropriate circumstances by the Chicago Schools. Formal general courses should be organized to supplement individual instruction, always bearing in mind the goal of integrated teaching. A list of all neuropsychiatric activities, classes, lectures and meetings should be kept active for the student group.

3. Graduate students who come to Chicago for special purposes such as work with a particular authority or study in a single department may be referred to the Committee on Graduate education for supplemental work. In this manner too early specialization may be prevented. Neurosurgeons may be expected to have a sound grounding in neurology so that they may be proficient in clinical diagnosis as well as air insufflation. Psychiatrists and psychoanalysts may be introduced to the machinery whose creaks and cracks produce the complexes and psychoses of which they deal. Neurologists may learn about the higher application of Jacksonian principles to psychodynamics. All students will get an authentic account of their entire specialty. No longer will they be biased by a neurologist who pleads for organicists to gird their defenses against the onslaught of the functionalists; no longer will psychoanalysts disregard the brain and non-psychological therapy. No one can do all things proficiently but everyone can know objectively and scientifically the valid technics and ramifications of his field.

4. There are a number of externships, internships, residencies and laboratory assistantships in the Chicago area. It is often by chance that these coveted positions are filled by individuals deserving of the opportunities afforded. Under the Chicago plan they may be filled by the most capable and outstanding individuals whose preliminary work will be under the constant scrutiny of a preceptor. Through such a system we may facilitate the use of several training centers languishing for students. Oak Forest can be made the Salpetriere of America — the state hospitals, the county Psychopathic hospital and numerous clinics are all available for graduate students.

5. From such a student group we can recommend really well trained specialists to the licensing board. They may form a reservoir from which to fill positions in our local hospital, university and state institution. Graduates of such a training will not moan that what they have been taught is theirs by inheritance, is claimed by others. They will realize there is all too much for each to learn and do in a single life-time. Here in Chicago we may raise the general standard of neuropsychiatry and even that of the board itself.

As I stated before it is impossible to work out a practical plan for Graduate teaching of neuropsychiatry in Chicago without the help of many minds. My purpose tonight has been to convince you of the desirability and feasibility of a *city-wide interinstitutional plan*. The details are tremendous, the task gigantic but the goal is worth the effort.

THE TREATMENT OF HEREDITARY GLAUCOMA

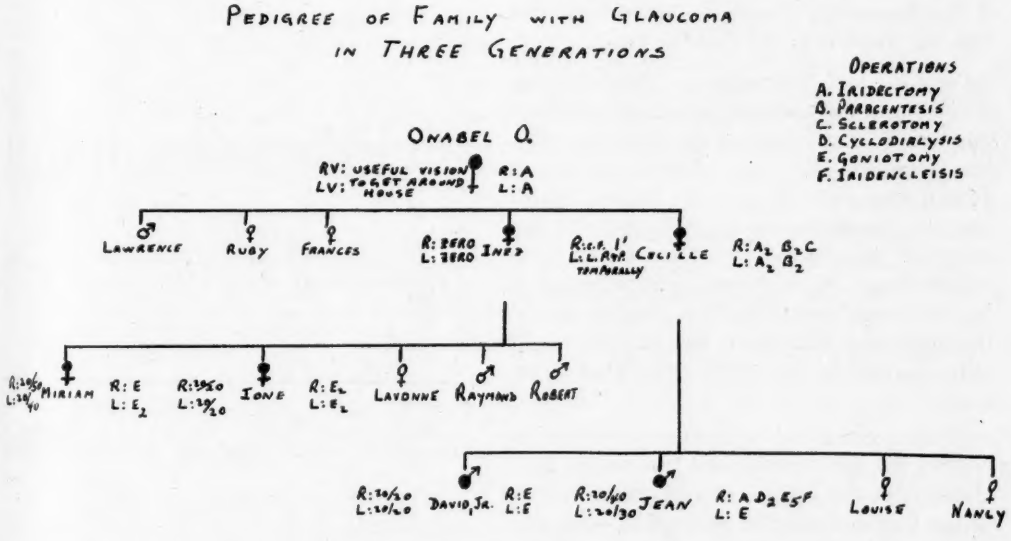
WALTER G. ACKERMAN, M. D.
AND
THOMAS D. ALLEN, M. D.
CHICAGO

It is our purpose to deal with the treatment of hereditary glaucoma; many of the important characteristics and findings of this interesting condition will be dealt with in a report to be presented before the Section of Ophthalmology of The American Medical Association this year. The prognosis and results of treatment have never been satisfactory, as a close study of the literature indicates.

From this genealogical tree, it can be seen that the pedigree contains seven members of a family of three generations affected with hereditary glaucoma. Of the 14 descendants of the originally affected member, six had glaucoma, making a ratio of six affected to eight non-affected. The average age of onset of all seven affected members was 11.6 years with a span from 7 to 15 years. There was found no tendency to anticipation. There were four female to two male affected members from the original female affected ancestor. A slight decrease in corneal diameter was found in one member and reported present in another. No tendency for hydrophthalmia was noted in any of the affected members and the reports in the literature would indicate that hydrophthalmia is not commonly seen in patients with hereditary glaucoma, although there are several reports of the presence of these two conditions in the same pedigree. There was no evidence of alteration of depth of the anterior chambers or of the presence of an enlarged lens. Myopia was found in two of four members in which a refraction could be determined, with 5 or more diopters of myopia in one patient and a variable degree of 1 to 5 diopters in the difficultly controlled eye of the other.

The glaucoma in the members of this pedigree was of a chronic simple type. Instances of an acute type of hereditary glaucoma have also been reported and it seems that the type of glaucoma usually is the same in the same family, although there are reports of families in which both the

Presented before the Section on Eye, Ear, Nose and Throat, 101st Annual Meeting, Illinois State Medical Society, Chicago, May 20, 1941.



acute and chronic type of glaucoma have been present. The predisposition for eyes with dark irides to be affected with hereditary glaucoma is noted in the literature and this condition was found in four of the seven members of the present pedigree. The fifth had blue irides and the other two members were not seen by the authors.

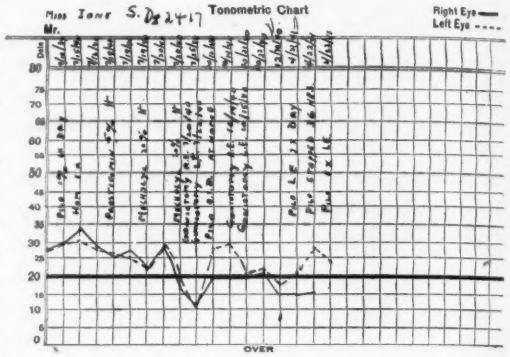
Members of the family of this report were of French-English stock. No particular racial group is reported as having a tendency to hereditary glaucoma.

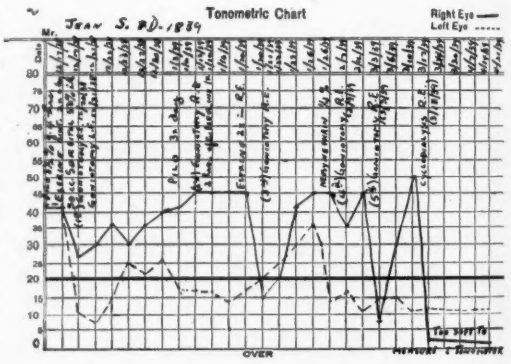
The gonioscopic findings in this disorder have not been previously recorded in the literature. In each of two patients (Jean S. and Miriam S.) on which gonioscopy was done before any surgery was performed there were found many fine iris processes with finger or web-like projections extending anteriorly towards the limbal portion of the cornea. No other relation to the height of the intraocular tension could be associated with any findings in the chamber angle.

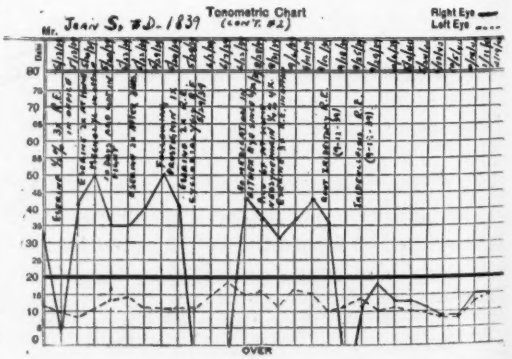
Prognosis and Treatment — The concensus of opinion in the literature regarding hereditary glaucoma is that it cannot be controlled without operation and that effective control is difficult even with operation. It has been stated that the disease cannot be controlled for any length of time by the use of miotics or hypotensive drugs. Most of the authors including Stokes[1] in his recent article in the Archives of Ophthalmology have stated that the best results were obtained by one of the fistulizing operations.

Early operation before irreparable damage has occured has also been stressed. From a study of members of our family, we find that the intraocular tension responded poorly if at all to miotics alone. As to the relative effectiveness of the various surgical procedures, iridectomy and posterior sclerotomy were found to be ineffective in controlling the situation. In one patient, one goniotomy has been effective (29 months) in one eye (L.E.), while in the other eye, five goniotomies, two cyclodialyses and a deep root iridectomy were without result; an iridencleisis has now controlled the condition up to the present time (19 months).

Two goniotomies performed a year apart on each eye of a second affected member (Ione S.) have apparently sufficed for nine months. In a third member (Miriam S.) one goniotomy of the right eye 18 months ago and two of the left 18 and 6 months ago have controlled the condition to date. In a fourth member (David S.) a single goniotomy of the left 8 months ago has controlled the tension, fields and vision.







Report of Cases

A. First Generation

1. Mrs. O.O. had bilateral iridectomy at the age of 11. (60 years ago.) She has markedly impaired vision but sufficient to get around the house.

B. Second Generation

2. Mrs. I.S., daughter of Mrs. O.O., has had no operations and is blind according to her sister, Mrs. D.S.
3. Mrs. D.S., No. D—3827, daughter of Mrs. O. O., had symptoms, at age of 14, of colored rings around lights and headaches. She used drops (eserine) for about a year. Then she had bilateral iridectomy. One year later she had a bilateral paracentesis and a repetition of paracentesis of both eyes and a sclerotomy of one eye six months later. When seen by us at the age of 46, the tension of each eye was 17 mm. The right vision was counting of fingers at one foot with no light projection nasally; left vision was L.P. & P. temporally only. Fields were unsatisfactory but markedly constricted.

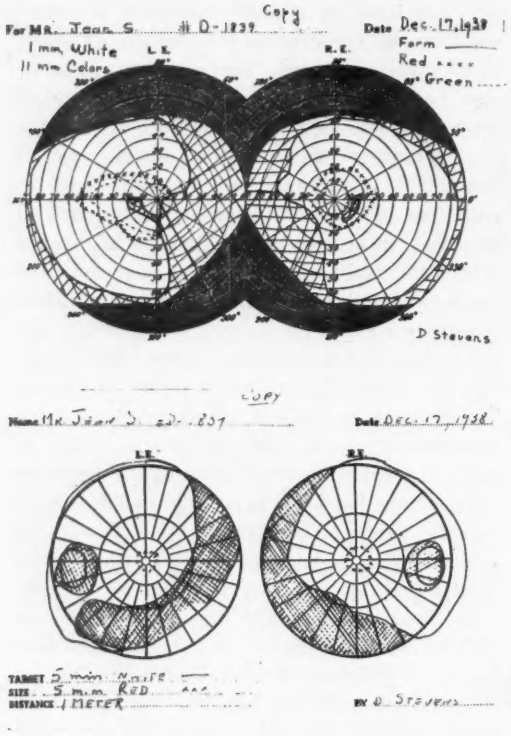
C. Third Generation

4. J.S., No D—1839, son of Mrs. D.S., No. 3827: A single goniotomy in the L.E. over 2 years ago, has controlled the situation to date. In the other eye, five goniotomies had little effect. Cyclodialyses on two occasions controlled the glaucoma for two to three months and a deep root iridectomy was then without effect. Subsequent iridencleisis has controlled the glaucoma up to the present time which is over a period of 1½ years.
5. Two goniotomies performed on each eye (July and Oct. 1940) of a second affected member, Miss Ione S., No. D—2417, daughter of Mrs. I.S., were sufficient to control the tension to date (December 30, 1940—five months).
6. Miss M.S., (now Mrs. M.P.), No. D—2504, daughter of Mrs. I.S.,: A goniotomy of the right eye was sufficient to control the situation for 18 months while a goniotomy of the left eye had to be repeated after 1 year; this has controlled the tension for six months to date, December 30, 1940.
7. D.S., No. D—2644, son of Mrs. D.S., No. D—3827: A goniotomy of the right eye has controlled the tension for twenty months and a goniotomy of the left eye has controlled the tension for 8 months.

Technique of Goniotomy and After Care — A thorough study of the chamber angle must be made before any attempt at goniotomy. Schlemm's area must be located. If it is not seen it is quite evident that goniotomy will do no good. If it is recognized one must study the pectinate ligament and the peripheral iris processes especially to discover the presence of vessels which must be avoided. The technique of goniotomy has been as follows: The usual surgical precautions are used such as culture of conjunctival scrapings and irrigation of the nasolacrimal duct. Local anesthesia is produced by instillations of 4% cocaine into the conjunctival sac and 1% cocaine with adrenalin is injected subconjunctivally near the area to be incised; the eye is fixed with forceps and the goniotomy knife is introduced into the anterior chamber through the limbus at a point approximately 135° opposite the sector of chamber angle to be incised. The blade of the knife is introduced parallel and just anterior to the plane of the iris. With the point of the knife almost touching the pectinate ligament the flat blade is made to indent the iris in order to again verify the position. Bearing in mind the relative positions as seen with the gonioscope one can now raise the blade so that the point is in the trabecular area. A sector of one fifth to one sixth the circumference of the limbus is *very lightly* incised. The usual site for this surgical procedure has been the lower temporal quadrant but one must avoid any blood vessels. No contact lens is used and magnification is provided by a Beebe or Zeiss loupe. The knife we use has a Barkan cutting point and edge and a *cylindrical* not a conical shaft. The cylindrical shaft allows for easier manipulation. The shaft is about 12 mm. long. No mydriatic is usually used in the postoperative care but rather a *miotic,* as we wish to pull the iris away from the operative area so synechiae will not form.

The advantages of goniotomy are that it is simple to perform, easily repeated if necesary and that it does not visibly deform or change the appearance of the eye. Its main danger as we see it is the possibility of profuse hemorrhage into the chamber by cutting too deeply or by cutting a superficial vessel. This may be avaided by close preoperative study with the gonioscope. A bare nicking of the trabeculae is all that is necessary. The other dangers are similar to those of any intraocular operation.

A comparison of the fields taken at intervals for two of the patients in this family reveals an increased contraction in both eyes of one patient (Jean S.) and a slight change in one eye of the other (Ione S.) during the period of observation, almost two years.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11 mm Colors
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Green
L.E.
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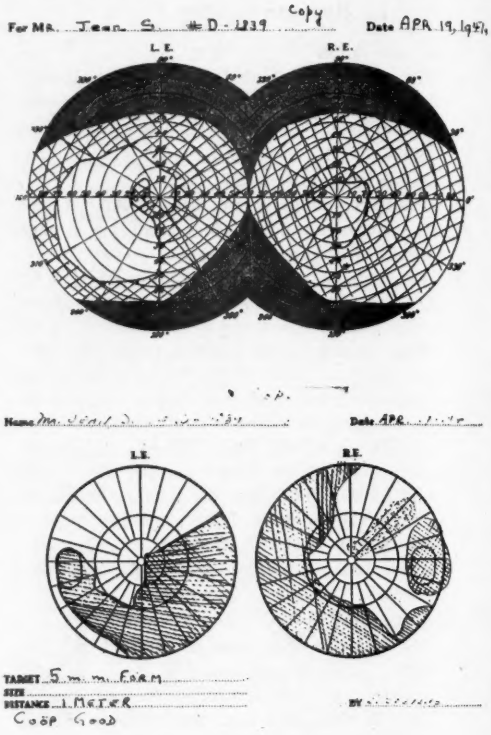
BY D. Stevens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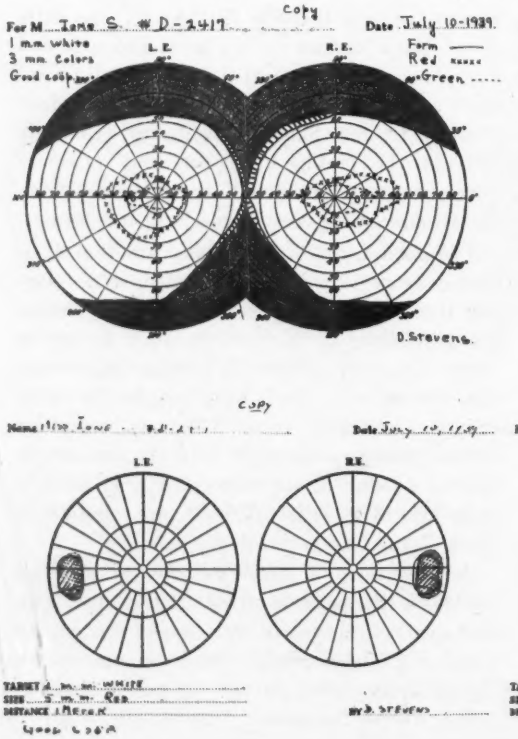
Coop Good


For Miss Jane S. # D-2417 Copy
Date July 10-1939.
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3 mm. Colors
Good coop
Form
Red
Green
L.E.
R.E.
D.Stevens.
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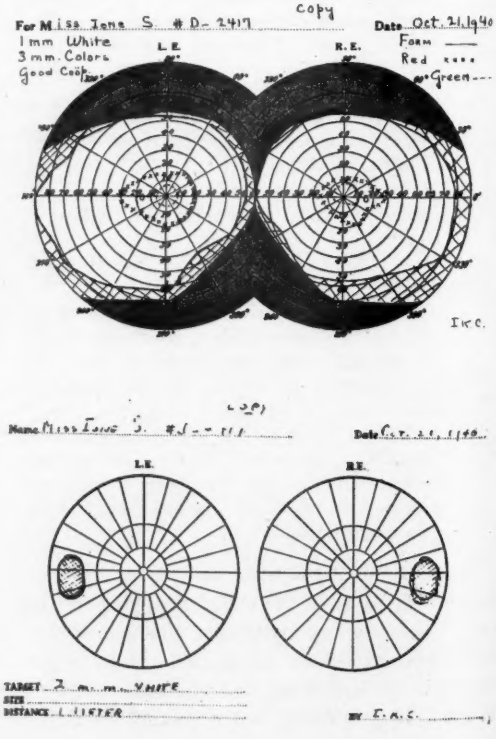
Good Coop
BY D. STEVENS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Date Oct. 21, 1940
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3 mm. Colors
Good Coop
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Green
L.E.
R.E.
I.W.C.
Copy
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Date Oct. 21, 1940
TARGET 3 m.m. WHITE
SIZE
DISTANCE 1 METER
BY I.W.C.

SUMMARY AND CONCLUSIONS

From an analysis of the findings in a pedigree with hereditary glaucoma in which 7 out of a total of 15 members had glaucoma:

1. We have experienced the same difficulty in controlling this condition both with miotics and surgery as reported by other writers on this subject.

2. Surgical procedures such as paracentesis, iridectomy, posterior sclerotomy and cyclodialysis were found to be relatively ineffective. A single goniotomy was effective in controlling the tension in four eyes. Two goniotomies were required to control the tension in three eyes and in an eighth eye an iridencleisis was finally required to control the tension after five goniotomies, two cyclodialyses and a deep root iridectomy failed.

3. From the observations made on members of this family with hereditary glaucoma it is felt that although miotics alone are relatively ineffective in controlling the tension before surgery, they may be of value in helping maintain the lowered tension *before* surgery; they are often of value in helping maintain the lowered tension *following* surgery.

4. Early control of the glaucoma before much loss of vision has occurred must be stressed and for this reason the finding of glaucoma at an early age is an indication to search for a tendency to glaucoma in every other member of the family.

REFERENCE

1. Stokes, Wm. H., Hereditary Primary Galucoma: A Pedigree With Five Generations. Archives of Ophthalmology, Nov. 1940.

DISCUSSION

Dr. Samuel J. Meyer, Chicago: Hereditary or familial glaucoma has been known for 100 years, but it is quite rare. Benedict first described this clinical entity in 1842. In 1932 Bell collected 295 cases. It is a dominant and continuous characteristic in heredity, and it may be transmitted by both sexes. The parent who is the transmitter is usually affected.

Von Graefe in 1869 first noted the presence of anticipation. Siblings tend to become liable at approximately the same age, the age being determined by the age of the onset in the parent. An average anticipation for the mean age of onset in the offspring is some ten years earlier than in the parent. For this reason, the age of onset in hereditary cases is, on the average, some twenty years earlier than in a general series of cases of glaucoma. Thus, Bell found in 1932 that 52 per cent of 196 hereditary cases occurred before the age of 30 years, while only 3.6 per cent of 3,021 general cases came under this category. As a general rule, the hereditary cases have appeared in otherwise healthy stock with no demonstrable association with any other disease or congenital defect.

The mechanism by which the hereditary influence acts is unknown. It is possible that the heritage of a small eye and a large lens may have some influence in the matter, or that congenital malformations at the filtration angle (as occurred in Dr. Ackerman's cases) may be handed down; but the complete lack of association between hereditary primary glaucoma and buphthalmos seems to deny this explanation. The fact remains that the literature contains no evidence of the source of glaucoma in hereditary cases, but there is no doubt that the affected members of a family so tainted should abstain from parentage. Indeed, there is a grave risk to the offspring of any sibling, affected or not, belonging to a stock known to carry the disease in hereditary form.

The surgery in such cases, as in all cases of juvenile glaucoma (15 per cent of such cases are of hereditary character (Lohlein) is rather unsatisfactory. If it is definitely proven by more gonioscopic examinations that congenital malformations at the filtration angle are present, then goniotomy may be of value. But I am certain that those of us who have practiced goniotomy know the difficulties encountered in such surgery and the uncertainty of the end results.

The author is to be commended for the presentation of this relatively rare condition and the use of gonioscopy to enhance further our knowledge in the surgical approach of treatment in such refractory cases.

Dr. Louis Ostrom, Rock Island: May I ask if they have any means of measuring the size of the lens in these conditions to determine anything of value in this work?

Dr. Sanford Gifford, Chicago: I might mention a very similar family I have had in which iridencleisis was quite successful in two members. The oldest sister was seen when she was quite blind by my father in Omaha; she was about 40 years old and absolutely blind. Two younger sisters were worked up by Dr. Post in Joplin. I saw them when they were about 19 years of age. The tension remained about 35 to 40 and they still had good central vision. In both cases bilateral iridencleisis was successful in keeping the tension down. In one case the bleb became very thin and had to be cauterized two years later. It did not cause a rise in tension. She wrote me several years ago and wanted to know if she should get married. I knew she would anyway, so told her to go ahead and I hope to see the children some day.

About buphthalmos, I would like to say that we should put in a plea for early treatment when it comes along; and to say that either trephine or iridencleisis has been successful in a number of cases. I have had

good results in a number of cases, in only two of which did it fail to control the tension. I think we should not wait until the vision is lost. In one case the obstetrician recognized the condition immediately after birth and I operated at the age of 7 days. It was a unilateral case with a steamy cornea and rupture of Descemt's membrane. It never became enlarged. The child is now 3, has myopia of about diopters, has useful vision and the tension is under control.

Dr. Hallard Beard: I should like to ask by what mechanism the goniotomy accomplishes lowering of intraocular pressure.

Dr. Frederick A. Davis, Madison, Wisc.: I have enjoyed this. It is an important subject. None of us see too many of these cases but we do encounter them occasionally. I should like to cite one case of hereditary glaucoma, that of a girl of 18. The mother has had chronic simple glaucoma for many years. I used a modified LaGrange, with a fairly good sized sclerectomy, with incarceration of one iris pillar. The tension was reduced from 50 to 15 and has remained so. The appearance of the anterior chamber is interesting; it was very shallow, unevenly shallow, with a distorted, swollen lens.

I have operated a number of cases of congenital buphthalmos after the manner described by Dr. Gifford. Trephining is usually quite successful in these cases if done early, before the disease is advanced.

Dr. W. G. Ackerman, Chicago (closing) I want to thank Dr. Meyer for his discussion.

We found no evidence of abnormality of the lens. The literature, so far as we were able to find, mentions none in hereditary glaucoma.

Dr. Beard asked about the mechanism of goniotomy. We believe that it is necessary to incise the trabecular fibers so that aqueous will get to the canal of Schlemm.

I enjoyed Dr. Gifford's comments. In our cases iridencleisis certainly worked very well. We tried goniotomy and got excellent results in several and in three eyes we had to repeat it once. The advantage is that following goniotomy the patient has a normal looking eye. There is no evidence of any operation having been done. The post-operative course is short. If it works it is well worth while. It can be repeated as often as necessary. If the incision is too deep, however, a hemorrhage into the anterior chamber may occur.

NOTHING A CHECK WON'T CURE

"When will your dad be able to work again?" *Dr. C. S. Venable* of San Antonio asked the small son of the workman who had met with an accident.

"Can't say for certain," replied the boy, "but it won't be for some time 'cause compensation's set in."

SUBDURAL HEMATOMA

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The problem of the subdural hematoma is, from both the clinical and pathological viewpoints, far more complicated than the ordinary presentation would lead one to believe. Although many of the facts connected with this subject are sufficiently clear, others dealing with all phases of the problem, etiologic, pathogenic and diagnostic, are still very obscure.

From a clinical standpoint, these hematomas may be divided into acute, subacute and chronic. They may affect persons of any age or sex but they are far more prevalent in males and occur most frequently in infants and in persons past middle age.

Acute Subdural Hemorrhage. The acute extravasation of blood into the subdural space is a common occurrence in association with severe cranio-cerebral injuries. Ordinarily the amount of blood found under such circumstances is small and associated with other far more severe injuries to the brain such as haemorrhage into the brain stem, extensive cerebral laceration and contusion which are primarily responsible for the patient's critical condition and frequently his death.

On occasion, however, the profuse outpouring of blood into the subdural space appears to be the primary factor in the case. The following is such a one:

CASE 1

J. K., a male laborer 47 years of age, was referred by Dr. W. H. Lipman of Chicago. This man accidentally fell from a scaffold on the morning of July 12, 1932. He was admitted to the University of Chicago Clinics at 10:30 a.m. that morning. On admission he was comatose. The blood pressure was 150/70, pulse-rate 60, and respiratory rate 15 per minute. He was somewhat cyanotic. Babinski's sign was present bilaterally. The left pupil was dilated to over 6 mm. in diameter, the right was about 2 mm. Neither reacted to light.

A diagnosis of an intracranial hemorrhage on the left side was made, and he was taken to the operating room as soon as preparations could be made. At 11:50 a.m., under local anaesthesia, a linear incision and trephine opening were made in the left temporal region. There was no extra-dural blood. On

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incising the dura mater, a large quantity of dark liquid blood escaped from the subdural space. It was evacuated as thoroughly as possible and the space drained. Just prior to opening the dura mater, the systolic blood pressure had risen to 170 mm. of Hg. and the respiratory rate had fallen to 6 per minute. The pulse rate was still 60. After evacuating the blood, the blood pressure fell to 120/60, the pulse rate rose to 130 and the respiratory rate to 30.

Following the operation, blood continued to drain profusely, the patient remained comatose, developed a hyperthermia and soon died. Unfortunately, the coroner refused to permit a post-mortem examination.

In spite of the lack of the complete information which a necropsy would have given us, it seems reasonable to assume that one or more of the large veins crossing the subdural space from the cerebrum to the superior longitudinal sinus were severely torn allowing the profuse extravasation of blood into this space. That the condition was entirely traumatic, also, seems reasonable. There may, of course, have been other injuries of the brain here which would have precluded this man's recovering. However, it is barely possible that in similar cases a direct exposure of the region just lateral to the superior longitudinal sinus might permit one to occlude the bleeding vessels and allow some of these patients to recover. Perhaps this is too optimistic for one is dealing with critically ill patients, and the exposure might have to be very extensive to be effective.

Subacute Subdural Hematoma. Much more commonly, the extravasation of blood into the subdural space occurs more slowly than in the case just recited, as in the following instance:

CASE 2

H. C. R., a dentist 40 years of age, was referred by Dr. Albert Zrunek of Chicago. This man was known to have been a victim of severe chronic alcoholism for many years. Immediately prior to his present illness, he was however otherwise well.

On the evening of March 3, 1941, he went to his home alone. Exactly what happened there is not known, but it appears that he probably fell down the cellar stairs, striking his head on the concrete floor. He sustained a laceration of the scalp in the right temporal region. He lay there long enough for a considerable pool of blood to accumulate on the floor. He then got up and and went to his bed, but by that time the wound had practically ceased bleeding as the bed clothing was but little stained. About noon on March 4, he came to his laboratory and worked there that afternoon. He suffered from a mild headache and was slightly drowsy but as this was not uncommon with him, little attention was paid to these symptoms. The following morning he seemed all right. That afternoon his speech was somewhat thick and hesitant. He had difficulty in writing down telephone numbers, and he complained of headache. That night he was restless and moaned frequently. On the morning of March 6, he was unable to talk. He had difficulty in using his right hand but was able to walk normally. He drank a glass of water and shortly vomited. There was a slight right lower facial weakness. The tendon reflexes were slightly more active on the right side. The right abdominal reflexes were diminished. Babinski's sign was present on the right side. The pupils and optic discs were normal. Sensation, as far as could be tested was intact. Blood pressure was 180/90, pulse 96, respirations 24, and temperature 102° (F.).

He was immediately transferred to the Chicago Memorial Hospital. X-ray examination revealed a linear fracture in the lower part of the right parietal bone extending into the lateral part of the right spenoid bone. The laboratory examinations, including the Wassermann and Kahn tests, on the blood were all negative.

In spite of the obvious injuries to scalp and skull on the right side, a diagnosis of an intracranial hemorrhage on the left side was made. An incision and trepanation were made in the left temporal region. There was a large subdural coagulated hematoma of recent origin covering the entire left temporal lobe. After this was removed, it was seen that the cortex of the left temporal lobe was considerably contused and lacerated, and there were numerous torn vessels, mostly small veins, from which this hematoma had doubtless originated.

This man's condition rapidly improved following the operation, and he left the hospital practically completely recovered 17 days later, on March 23.

Here again the situation seems clear. The bleeding was less profuse than in Case 1 because the torn vessels were of much smaller calibre. The injury to the left temporal lobe, when it was apparently the right side of the head which struck the concrete floor, is of the familiar *contra coup* type. There appears to be no reason to attribute the injury to anything except trauma. His alcoholism apparently accounts only for the fall down the stairs. There is no reason, in this case, to assign to it any more direct role in the production of the hemorrhage.

As will be pointed out later the role of injury in the production of subdural hematomas is not always as clear as in this case. Thrombosis of the superior longitudinal sinus and of the cerebral veins draining into it is one of the causes of the subdural effusion of blood. In most such cases the interference with cerebral cir-

culation, the edema of and herorrhage into the cerebral substance completely over shadow the subdural hemorrhage in clinical importance. Recently, however, Lesemann and I have reported a case in which thrombosis of the cerebral cortical veins, in a case of recurrent thrombophlebitis, resulted in a subdural hematoma of such magnitude as to produce increased intracranial pressure and evidence of the compression of one of the cerebral hemisphere.

Subdural Hydroma. There is another condition which follows rather closely on the heels of a cranio-cerebral injury and which presents a clinical picture indistinguishable from that seen with a subacute subdural hematoma. It is known as subdural hydroma. The following is a typical example:

CASE 3

I. E., a man 44 years of age, was referred by Dr. Charles Berkowitz of Chicago.

On September 10, 1933, he was in an automobile accident as a result of which he was unconscious for a time and subsequently vomited. He was taken to a hospital but returned to his home the following day. Although he suffered from a continuous headache, he was up and about all day. Three days after the accident, on September 13, he became dull and lethargic, and on the following day (9-14-33), he was admitted to the University of Chicago Clinics in a semi-stuporous condition. He could be aroused and would answer questions quite intelligently and would then lapse back into a stuporous state. His blood pressure was 170/90, the pulse rate 40 and the respiratory rate 8 to 12 per minute. The tendon reflexes were more active in the left extremities. The abdominal reflexes were absent on the left side and Babinski's sign was positive on the left. X-ray examination of the skull revealed two linear fractures in the right parieto-occipital region. A lumbar puncture was performed and revealed bloody spinal fluid under a pressure of 350 mm. of fluid.

A diagnosis of an intracranial hemorrhage, probably subdural, on the right side was made. He was operated upon, an incision and trephine opening being made in the right temporal region. On incising the dura mater, a large quantity of slightly bloody cerebrospinal fluid was found in the subdural space. Over 60 cc. were evacuated.

Following the operation, he rapidly recovered and was discharged from the hospital on September 22.

Clinically the picture produced by these subdural hydromas does not differ materially from that caused by a subacute subdural hematoma (Case 2). In both cases the symptoms are those of localized and generalized cerebral compression.

These subdural collections of cerebrospinal fluid arise as the result of a small tear in the arachnoid membrane which allows fluid to be forced from the subarachnoid into the subdural space. But as the fluid accumulates in the subdural space, it compresses the arachnoid membrane against the brain preventing its own escape.

These are not common lesions but have been recognized and described by many neurological surgeons.

Chronic Subdural Hematoma. Few intracranial lesions can present as many difficult and confusing problems, both from the etiologic and diagnostic standpoints as the chronic subdural hematomas. In the classical case this is, of course, not true. And one might readily gather from the textbooks and current literature that all cases follow a standard pattern. Unfortunately, such is frequently not the case. In all too many instances, the lesion is not recognized until disclosed at necropsy and in still a larger number of cases the cause for its existence is never determined.

For orientation a classical case will be first considered.

CASE 4

A. R. H., a lawyer 71 years of age, was referred by Dr. C. H. Drenckhahn of Urbana, Illinois. He was a vigorous, active well man until about February 10, 1941, when while bathing before dinner he slipped in the bath tub and fell, striking his right cheek. He was momentarily dazed but was not unconscious, and although the local injury was painful he dressed and attended a banquet that evening. The next day he had a headache and these continued, gradually increasing in severity. He developed dizziness and his gait became so uncertain that his sobriety was questioned. He consulted several physicians who could find no abnormality except that his teeth were not in good condition. Physical examination, electrocardiograms, x-rays of the skull, examinations of the urine, blood and spinal fluid all failed to reveal any abnormality. It was decided to remove his teeth over a period of several days. In the midst of this procedure, on April 3, 1941, he became lethargic. The following day he developed a partial aphasia and right hemiplegia. And early on the morning of April 5 he became comatose. I first saw him at 4:00 p.m. that day at the Carle Hospital in Urbana. The temperature was 99° (F.), the pulse 80 and respirations 20. The blood pressure was 95/60, whereas it had formerly been about 130/80. He was in deep coma. The optic discs were normal. The right pupil was dilated but neither reacted to light. All four ex-

tremities were completely flaccid. The tendon reflexes were present but equal on the two sides. Babinski's sign was present bilaterally. He did not respond to painful stimuli.

On the basis of the history alone a diagnosis of a left subdural hematoma was made, and he was operated upon at 5:30 p.m. on that afternoon, April 5. On opening the dura mater, a membrane about 2 mm. thick was exposed. This was readily separable from the dura mater of which it was not a part. When this membrane was ruptured, a large quantity of dark reddish brown fluid containing a few small clots was evacuated. The cavity was thoroughly irrigated and a soft rubber drain was inserted. The drain was removed the following day.

Under the expert attention of Dr. Drenckhahn and his associates, this man rapidly recovered and has long since engaged actively in his professional duties.

The entire picture here seems clear. About February 10 he fell, striking his face. This blow, causing a forward shift of the brain, produced small tears in one or more of the veins passing from the left cerebral hemisphere to the superior longitudinal sinus. It is a well established fact that although any cranial injury may lead to a subdural hematoma, blows on the front and back of the head cause greater strain on these veins and thus are more apt to lead to such a hemorrhage. That these veins do tear in this fashion is no surprise to anyone who has exposed them at operation. Typically these veins leave the cerebral substance well lateral to the sinus, cross through the pia mater, the subarachnoid space and arachnoid membrane and then run for considerable distances in the subdural space to reach the sinus or one of the dural venous lakes lying lateral to it. In the subdural space, these thin walled veins are supported only by a thin outer layer of arachnoid membrane. They are readily torn at their point of attachment to the rigid dura mater, as every neurological surgeon knows.

However, these tears are small and the amount of bleeding as evidenced by the lack of symptoms at the time, and often for some time thereafter, is small. This is not surprising since the pressure in these veins is low at all times and with the individual upright, is in fact lower than atmospheric tension. How then does this small quantity of blood give rise to a progressively increasing clinical disturbance which may, as in Case 4, require two months or even more before the true nature of the trouble is recognized? What happens in these cases has been clearly pointed out by Gardner. It is obvious from the nature of the fluid in these subdural cysts that we are not dealing with pure blood. The blood has disintegrated and obviously been diluted. This dilution may occur in one or both of two ways. In some cases, there is not only an extravasation of blood into the subdural space but a discharge of cerebrospinal fluid through a tear in the arachnoid membrane (as in Case 3) as well. However, this does not explain cases such as Case 4, where the symptoms develop so slowly over so long a period of time. Here another mechanism is operative.

The blood once released into the subdural space has no avenue of escape as there is no capillary bed by means of which it can be absorbed. This loculated blood, like blood entrapped elsewhere in the body, begins slowly to disintegrate. The red blood cells disintegrate, discharging their contents into the plasma and thereby raising its protein content and thus its osmotic tension. Furthermore, the larger protein molecules also break down into smaller ones and raise the osmotic tension even further. This hypertonic fluid is separated from the cerebrospinal fluid, with its very low protein content, only by the capsule of the cyst and the thin arachnoid membrane. Accordingly, this membrane acts as a dialyzing membrane, and fluid is drawn through it diluting this disintegrating blood. It is possible that some fluid is also drawn by osmosis from the blood stream, particularly that in the numerous very thin walled capillary channels which form in the membrane of the cyst. This disintegration of the blood and accretion of the fluid by osmosis is naturally a slow and gradual process and fits well with the slowly developing clinical picture.

How the cyst wall about this hemorrhagic cyst is formed is still a matter of dispute. It is not, as will be further discussed later, formed by the inner layer of the dura mater. It is formed *de novo*. The fibroblasts which proliferate to form this loose, vascular connective tissue may arise from the fibroblasts of the dura mater and the arachnoid membrane. This seems unlikely as the cyst wall is distinctly separate from these two membranous structures and usually readily separable from them. Years ago Maximow showed that the white cells of

the blood are capable of being transformed into fibroblasts. It seems most likely that in these cases this bloody fluid acts as a tissue culture in which these cells do so metamorphose and in turn give rise to this loose, vascular encapsulating connective tissue membrane.

Although in this case, and in many others the etiological factor of trauma seems obvious, even that aspect warrants further investigation. In this case, the cranial injury, though definite, cannot be regarded as severe. In many instances it is even less marked. In some in fact it is so trivial and so remote that it is seriously regarded as an etiologic factor only by the most credulous. Certainly if cranial injury be the sole etiologic factor, then subdural hematomas should bear a direct relationship to the severity and incidence of such injury. This may possibly be true of the acute and subacute hematomas illustrated by Cases 1 and 2. It is not true of the chronic subdural hematomas. More often than not, they follow slight injuries or apparently none at all. They show a definite tendency to develop in the infant and in those past middle age. That enormous group of vigorous healthy young adults from 20 to 35 years of age, who suffer so frequently from severe head injuries, are remarkably free from this disease if cranio-cerebral trauma be the sole-factor. It seems obvious that abnormally fragile blood vessels, due to whatever cause, must play a very prominent role. And although I would not deny the likelihood that in many, even most cases, trauma is the precipitating factor surely it is not unreasonable to believe that in some cases abnormality of the vessel walls alone is sufficient to permit of such a leakage of blood. Such a possibility must be particularly entertained in those cases without history of trauma, and where the development, diagnosis and treatment are not so clear cut, as in the cases already presented.

Occasionally various hemorrhagic dyscrasias of the blood, particularly the purpuric states, may be responsible for the extravasation of blood into the subdural space. It is also well known to the neuropathologists that thrombosis of the superior longitudinal sinus and the connecting cerebral veins commonly results in bleeding into the subdural space as well as into the cerebral substance. Usually in such cases the subdural bleeding is responsible for but a small part of the symptomatology. However, in an unusual case recently reported by Lesemann and me the subdural hematoma was a major factor.

The following three cases illustrate the very great diagnostic difficulties in some cases, as well as the obscurity of their etiology:

CASE 5

F. I. P., a physician 72 years of age, was relatively well until May 1, 1936, except that in 1933 a prostatectomy had been performed and he had suffered from a chronic pyelo-cystitis ever since.

On May 1, 1936, he began to have an occasional frontal headache. These gradually grew more severe and more frequent and after May 15 he suffered from nausea on occasion. On June 19, he came to Chicago and on that day vomited for the first time. He entered the University of Chicago Clinics, insisting that he was suffering from a brain tumor. However, complete physical and neurological examinations were negative as were roentgenograms of the skull and chest. On June 29, he became very stuporous. The blood pressure was 100/60, the optic discs were flat. A lumbar puncture was performed. The initial pressure was 218 mm. of fluid. The fluid was clear and colorless, contained three cells, a slight trace of globulin by Pandy's test, 66 mgm. % of glucose and 72 mgm. % of protein. The Wassermann tests on both blood and spinal fluid were negative.

On June 30, he was seen by me for the first time. He was then comatose and there were no localizing neurological findings. Because of the slightly increased spinal fluid pressure and his precarious condition, it was decided to make a right subtemporal decompression. This was done at 1:30 p.m. that day. On opening the dura mater, a large subdural hemorrhagic cyst was found. The thin friable capsule was readily separable from the dura mater. After evacuation of this cyst, the patient's condition was considerably improved but did not continue so. Therefore, on July 3, 1936, the skull was trephined on the left side, disclosing a similar large subdural hemorrhagic cyst. However, in contrast with the one on the right, this one contained definitely purulent material, and when cultured was found to contain the same bacterial organisms as the infected urine. Presumably they had been borne there by the blood stream. Although he improved for a time, he later gradually failed and died on July 8, 1936.

Necropsy disclosed a meningitis, cystitis, early bronchopneumonia and marked atherosclerosis.

At all times both the patient and his family denied knowledge of any possible injury which might be related to his terminal illness. That some trivial injury may have caused a small tear in one of the veins passing from the cere-

brum to the sinus, of course, cannot be denied. But it must be admitted that any such injury so trivial as to have escaped all memory could hardly have been more than a precipitating factor and in order for it to have been effective the venous walls must, for some unknown reason, have been unusually fragile.

The complication of infection within the cyst on the left side is unique in my experience nor do I believe that such is a common finding elsewhere.

This case also illustrates the well-known facts that these subdural collections of bloody fluid are not uncommonly bilateral; that they are commonly associated with little or no evidence of increased intracranial pressure, even on lumbar puncture; that headache, often in the absence of intracranial hypertension, is one of the outstanding symptoms; and, that localizing neurological manifestations are often lacking.

CASE 6

A. L., a dentist 25 years of age, was referred by Dr. F. R. Swiateck of Chicago.

On June 1, 1936, he began to suffer from severe fronto-occipital headaches. He also complained of a stiff neck and of dizziness. These latter two symptoms soon subsided but the headaches grew progressively more severe. On June 15, he began to complain of failing vision, his right arm and hand grew weaker. He had lost thirty pounds in weight. On June 30, he was admitted to the University of Chicago Clinics. Examination disclosed a marked bilateral papillaedema with large linear hemorrhages about the discs. He had a spastic right hemiparesis. Roentgenograms of the skull were negative. The Wassermann and Kahn tests on the blood, urinalysis and blood counts were all normal.

A diagnosis of a left frontal brain tumor was made, and on July 2, 1936, a left fronto-temporal osteoplastic flap was reflected by Dr. Percival Bailey. On reflecting the dura mater, a large subdural hemorrhagic cyst was exposed. The capsule was 2 mm. thick and readily separable from the dura mater. The cyst was evacuated and the capsule removed. On July 9, a trephine opening was made on the right side, but there was no subdural hemorrhagic cyst on that side. He promptly made a complete recovery and has since been engaged in an active dental practice.

Although this patient persistently denied knowledge of any craniocerebral trauma, one can not help but wonder if the initial temporary symptoms of stiffness of the neck and dizziness were not the result of subarachnoid bleeding due to some undisclosed accident. Nonetheless this case illustrates the difficulty of arriving at the proper diagnosis in the absence of a clearly related history of injury. Fortunately the treatment in this case was appropriate and successful in spite of this diagnostic error. Such was not the case in the following instance:

CASE 7

R. H., a railroadman 65 years of age, was referred by Dr. C. S. O'Neill of Chicago. At the time of his admission to the hospital, it was stated by his wife that he had been perfectly well prior to August 28, 1936 and had gone to church that day; that at 7:00 p.m. he became weak and sleepy and had gone to bed. A little later they were unable to arouse him, but subsequently he had awakened and then lapsed back into a coma. As will be seen, this story profoundly influenced the diagnosis.

After his death and the necropsy, the family stated that for three months he had suffered from headaches which became so severe as to cause him to stop work and limit his activities. These headaches continued and a week prior to his admission to the hospital, he began to complain of blurring of his vision. During this week he had been confined to bed, had vomited occasionally without preceding nausea, had been irrational and at times unconscious.

No history of any injury could be elicited.

He was admitted to the University of Chicago Clinics on August 29, 1936 at 12:15 a.m. He was stuporous but could be aroused slightly. He was restless. The blood pressure was 170/78. He had Cheyne-Stokes type of respirations. The pulse was very irregular but forceful, and the rate was approximately 62 per minute. The optic discs were normal. The pupils were small and equal and reacted slightly to light. There was a *right* facial weakness. The *left* arm was motionless although he moved the right arm and both legs. The tendon reflexes were more active on the right side. No abdominal reflexes could be elicited, and Babinski's sign was present bilaterally.

He grew steadily worse and died the following day — 8-30-36.

In view of the history of a sudden onset of stupor, only five hours before admission to the hospital, occurring in a man 66 years of age who had been "perfectly well" previously, a diagnosis of a cerebrovascular accident, either cerebral hemorrhage or thrombosis was made. It was later obvious that there had been gradually increasing evidence of intracranial disease for over three months. Had that history been available, a different diagnosis would certainly have been made.

At necropsy large bilateral subdural hemorrhagic cysts were found. They were filled with dark reddish brown fluid containing several small blood clots. The capsules of these cysts were readily separable from the dura mater, and the cysts had obviously not

arisen from any hemorrhage between layers of the dura mater. There was also marked cerebral arteriosclerosis and considerable generalized arteriosclerosis.

Microscopically, the capsule was composed of a loose connective tissue containing many rather large thin-walled blood spaces. There were numerous phagocytic cells and lymphocytes in this membrane but no polymorphonuclear leukocytes. The dura mater was intact and bore no direct relationship to the hematoma or its capsule.

Here again we are confronted with a subdural hemorrhagic cyst without any history of a cranio-cerebral injury; although it must be admitted, in this instance, that the family had demonstrated their unreliability as witnesses. Even so this and cases 5 and 6 clearly demonstrate some of the diagnostic difficulties encountered with this condition. Although cerebral compression is present in every case, and headaches are common and vomiting occasionally occurs, choking of the optic discs is frequently lacking. Even more confusing is the fact that the spinal fluid pressure is often not elevated (Case 4) and the spinal fluid itself is usually perfectly normal. Occasionally it may be slightly yellow and the protein content somewhat increased. Although *a priori*, it might be expected that encephalography would provide an excellent means of diagnosis, this procedure is usually disappointing and the encephalograms are often surprisingly "normal" in appearance. Very occasionally, as Dyke and Davidoff, have pointed out, a diagnostic encephalogram may be obtained. An entirely different aspect of encephalography in connection with this subject has recently come to my attention. In certain instances, it seems likely that encephalography may even result in the development of a subdural hematoma. This possibility will be illustrated by Case 8 and discussed in conjunction with it.

In view of the frequently normal cerebrospinal fluid pressure in the presence of severe headaches (Case 4), it is questionable if the headaches in these cases can be attributed always to increased intracranial pressure. Certainly in some instances, such increased intracranial pressure is present and could well account for the headache (e.g. Case 6). In others such is not the case and some other cause must be sought. It has occurred to me that this disintegrating blood may irritate the sensory nerves in the dura mater and account for the pain. Certainly that such broken-down blood is irritating is clearly shown by the clinical picture typical of subarachnoid hemorrhage.

The stupor is doubtless due to the cerebral compression and resulting cerebral ischemia. Psychotic manifestations are not uncommon, and they, as well as the convulsions, which occasionally occur, particularly in children, are doubtless related to this same generalized cerebral change.

Symptoms of localized cerebral involvement are often disturbingly absent as in Case 5. However, almost any type of localizing manifestation may be present. The most common symptoms of this type are those related to the pre-central cortex, paresis with spasticity, increased tendon reflexes and the sign of Babinski. Sensory changes are uncommon. Although it has been stated that aphasia and alterations in the visual fields do not occur, this is not true. I have recorded two instances of aphasia in this paper (Cases 2 and 4) and Naffziger and others have seen instances of homonymous hemianopia.

Encephalography. In pneumo-encephalography, it is not rare for the gas to pass through a rent in the arachnoid membrane and enter the subdural space. At times this air may form large collections between the brain and dura mater over the convexity of both cerebral hemispheres. This has usually been accepted as an innocuous development. A case has recently come to my attention in which it appears more than likely that this occurrence has been responsible for the subsequent development of bilateral subdural hematomas.

CASE 8

I. G., a salesman 66 years of age, was well until early in 1939, at which time he developed marked changes in his personality. He became slovenly in his personal appearance, disinterested in his family, began to commit little acts of petty thievery and to confabulate. By January, 1942, his behavior became intolerable to his family.

On January 7, 1942, he was admitted to another hospital. Neurological examination revealed no abnormal findings. The spinal fluid was normal. An encephalogram was performed. Three hundred fifty cc. of clear, colorless cerebrospinal fluid were removed and replaced by air. The encephalogram revealed no deformity of the ventricular system but very large collections of air in the subdural spaces

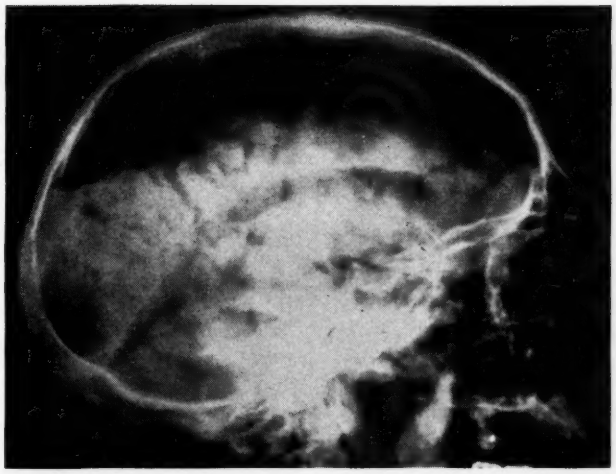

Figure 1

over both cerebral hemispheres (Figures 1 & 2). He became stuporous and although his stupor gradually lessened somewhat, his mental deterioration continued to be more profound than before.

On January 29, 1942, he was admitted to the Psychiatric Division of the Neuro-Psychiatric Institute of the University of Illinois. It was thought that he was probably suffering from a pre-senile dementia and a biopsy of the cerebral cortex was decided upon.

On April 6, 1942, Dr. Irving J. Speigel exposed the right frontal area. On incising the dura mater, a large subdural hemorrhagic cyst filled with a reddish brown fluid was found. This cyst was at least one and one-half inches deep. It extended from the frontal to the occipital pole. On April 14, a similar but much smaller cyst was evacuated on the left side.

Although he made an uneventful recovery from the operations, there has been little alteration in his mental state.

The entrance of air into the subdural space over the cerebral hemispheres allows those hemispheres to sag downward putting a great deal of traction on the veins entering the superior longitudinal sinus, as these and the pacchionian granulations are the hemispheres' only attachments to the vault of the cranial cavity. It would not be surprising if this pull were to produce small tears at the point of attachment of these veins to the sinus, thus allowing the escape of blood into the subdural space and resulting in the formation of a subdural hemorrhagic cyst as previously discussed.

It seems obvious in this case that no hematoma was present, when the encephalogram was made, for the space is filled with air and it is obvious that there could be no hematoma there. Yet

Figure 2

three months later, large subdural hematomas are found bilaterally. The conclusion seems obvious. And this case seems also to point to three rules to govern our future behavior in regard to pneumo-encephalography. First, it is probably unwise to remove large quantities of cerebrospinal fluid in this procedure. It is wise to stop when a maximum of 150 cc. of fluid have been removed regardless of whether more can be obtained or not. Second, the removal of fluid and injection of air or other gas should be done as gently as possible to avoid tearing the arachnoid membrane. And lastly, if air is accidently introduced into the subdural space, the patient should be kept in a nearly upright sitting position following the procedure to lower the pressure in the intracranial veins and diminish the amount of blood which will be extravasated.

Children. Repeatedly reference has been made here to the occurrence of subdural hematomas in children. Only in recent years has this condition received much attention and the fact that it is a relatively common neurological condition in children is still not well known. The following three cases are typical.

CASE 9

J. H., a male infant, was referred by Dr. Robert Black and Dr. Bengt L. K. Hamilton of Chicago. He was born normally on December 23, 1936 but was a little premature. He was well until March 12, when it was noted that his head was too large. He was admitted to the University of Chicago Clinics on May 24, 1937. The head measured 44.5 cm. in greatest circumference. The head was hydrocephalic in appearance. A needle was inserted through both lateral angles of the anterior fontanelle and xanthochromic fluid was aspirated from the subdural space on both sides. On May 27, 1937 a trephine opening was made on the right side. The subdural hemorrhagic cyst was evacuated, washed out and drained. The same procedure was repeated on June 3 on the left side. The infant recovered rapidly and left the hospital on June 14. The total protein in the fluid from the right side was 1020 mgm. % and from the left side 4090 mgm. %, as compared with spinal fluid with a normal protein content of 15 to 40 mgm. %.

When last seen on August 16, 1942, over five years after the operation he was perfectly well both mentally and physically and doing well in school.

CASE 10

N. V., a male infant, was referred by Dr. Willie Mae Clifton of the Children's Memorial Hospital, Chicago. This boy was born prematurely on January 11, 1937. The labor was easy and he seemed to be a normal child. In April, 1937, he suffered from his only convulsion. In June, it was first noted that his head was too large. On July 14 the lateral angles of the anterior fontanelle were punctured and bilateral subdural hematomas were found. These were punctured and aspirated repeatedly but without persistent improvement. On August 31, 1937, he was admitted to the University of Chicago Clinics. The head was large and measured 44.5 cm. in circumference. He was unable to hold his head up or to sit up. On September 1, a trephine opening was made on the left side and a large quantity of dark chocolate colored fluid was removed, the cyst irrigated and drained. On September 10, the same procedure was carried out on the right side. The child recovered rapidly and left the hospital on September 16.

CASE 11

R. W., a male infant, was referred by Dr. M. G. Peterman of Milwaukee and Dr. C. E. Pechous of Kenosha, Wisconsin. He had been born normally on June 13, 1938. In September he fell two feet off of a chair and landed on his abdomen on the floor. He did not seem to have been hurt. On November 20 he had a generalized convulsion and subsequently his head began to increase in size too rapidly. He was later seen by Dr. Peterman, who corroborated his diagnosis of subdural hematoma by aspirating dark reddish brown fluid from the subdural space on both sides. The child was admitted to the University of Chicago Clinics on January 7, 1939. The head measured 47.7 cm. in circumference. He was unable to sit up or even to roll over without assistance. The head had a hydrocephalic appearance. The child was operated upon on January 12. One hundred cc. of xanthochromic slightly bloody fluid was removed from the left side. The cyst on the right side contained only a small quantity of fluid. The child recovered rapidly and left the hospital on January 22. The child has been seen frequently since. He has developed normally. On January 5, 1942, when 3½ years old, his head measured fifty-one centimeters in circumference.

These three cases are sufficient to indicate that any child that suffers from a convulsion or begins to develop a hydrocephalic-type of head a few months after birth should be suspected of harboring a subdural hematoma. The diagnosis is readily confirmed or excluded by puncturing the subdural space through the lateral angles of the anterior fontanelle.

Ingraham who has seen and operated upon more of these children than anyone else says that any child who suffers from a chronic unexplained illness, vomiting, mental retardation, malnutrition, etc., etc., should be regarded as a possible victim of this condition.

It would seem in infants at least, (the condition may also less commonly occur in older

children) that the hemorrhage probably occurs as the result of trauma at birth and that the growth and development of the cyst follows the course outlined in the discussion of the condition in adults.

SUMMARY

Eleven typical cases of the collection of fluid in the subdural space have been presented. From these the following salient features can be drawn.

1. Collections of fluid may give rise to clinical pictures of variable rates of development and of variable intensity which permit of their classification as acute, subacute and chronic.

2. The material present in the subdural space may consist of liquid blood, coagulated blood, cerebrospinal fluid or disintegrating blood diluted by cerebrospinal fluid.

3. Cranial trauma alone may be an adequate etiological factor, particularly in acute and subacute cases.

4. (a) Frequently, particularly with chronic subdural hemorrhagic cysts, there is no history of trauma or the apparently exciting cranial injury is of a trivial nature.

(b) In such cases it must be concluded that the trauma if any was effective because of unusual fragility of the veins in the subdural space.

5. The bleeding usually comes from small tears in the veins passing from the cerebrum to the superior longitudinal sinus at their point of attachment to the dura mater. In instances of severe laceration of the cerebral cortex and the leptomeninx it may come from torn cortical vessels.

6. In acute and subacute cases the symptoms result directly from the accumulation of blood (or cerebrospinal fluid in cases of subdural hydroma) in the subdural space. These cases usually result from severe injury and may occur at any age.

7. In chronic subdural hemorrhagic cysts the trauma is often minimal. The victims are usually infants or adults beyond middle age. The symptoms result from a progressive train of events — a small amount of blood, which becomes encapsulated, disintegrates and thereby becomes hypertonic and then gradually increases in volume by the dialysis of cerebrospinal fluid through the arachnoid membrane.

8. Encapsulation results from a proliferation of fibroblasts which may come either by metamorphosis from the white cells of the blood or from the neighboring meninges.

9. The signs and symptoms of chronic subdural hemorrhagic cysts are often vague, variable and confusing.

(a) Headache is the most common symptom and is often severe. It may result from increased intracranial tension but in the absence of that may possibly be attributed to the irritating effect of disintegrating blood.

(b) Evidence of increased intracranial pressure, such as headache, vomiting, papilloedema and elevation of the spinal fluid pressure, may be present. But such intracranial hypertension is often conspicuously absent.

(c) Though encephalography may give useful diagnostic information, a negative pneumoencephalogram or one showing merely a diffuse ventricular dilatation does not exclude a subdural hematoma.

(d) Generalized cerebral compression may give rise to mental aberrations, stupor and generalized convulsions.

(e) Localized cerebral compression may give rise to any type of cerebral symptomatology including hemiparesis, sensory alterations, hemianopia or aphasia; though often there are no localizing manifestations.

(f) In infants subdural hemorrhagic cysts commonly result in enlargement of the head, convulsions, vomiting, malnutrition, etc.

10. It is not unlikely that large subdural collections of gas over the cerebral hemispheres, as a result of encephalography, may cause subdural hematomas.

11. In the majority of cases, simple evacuation, irrigation and brief drainage is a very satisfactory form of treatment.

CONCLUSIONS

It is obvious from a study of these few cases that subdural hematomas present most variable clinical pictures of cerebral disturbances. Accordingly the physician must always bear the possibility of the presence of a subdural hematoma in mind and in all cases where there is any likelihood of such a diagnosis, bilateral trephine openings should be made in the upper temporal regions. Fortunately, this is a simple and relatively innocuous procedure.

DISCUSSION

Dr. J. D. Kirshbaum, Chicago: I would like to ask Dr. Bucy whether he admits there is a true intradural hematoma. At autopsy I have seen these cases and if one sections the dura he can see hemorrhage coming from the vascular area of the dura. Personally I would like to admit that many of these cases are intradural in origin. The high incidence of alcoholism in this particular group of cases is interesting. In the cases I studied 80 per cent had admitted alcoholism. The question comes up whether we are not dealing with some vascular alteration due to the effects of alcoholism or avitaminosis. There has been a tendency to minimize true intradural hemorrhage.

Dr. Peter Bassoe, Chicago: It is true there is considerable ignorance about subdural hematoma among physicians including neurologists and neurologic surgeons, because the picture is manifold. It is especially difficult when the injury was slight and the interval between injury and hemorrhage long. The spinal fluid is most frequently clear and colorless which tends to make the average physician ignore the part played by the injury. Then, many other etiologic factors and symptoms are present that lead one astray. I can cite a typical case, which occurred on August 8, 1926. A man working on a farm was knocked over. He came into the house a few hours later and complained of headache. It was a busy time and he kept on working for six to eight weeks. Then he gradually became weak in the left side. I was asked to see him. I was told that he was queer, that he had fallen in love with an undesirable person. This man had a subdural hematoma. There was a large subdural organized clot about the size of the palm of my hand lying on the top of the hemisphere. If I had time I could tell you about many such cases, and one that Dr. Bucy knows about. A man was seen by another neurologist besides myself and a surgeon was called in consulation. The surgeon and I thought it was a brain tumor, the other neurologist encephalitis. The pathologist at autopsy found a subdural hematoma. On inquiry I learned that this man came home drunk and bruised up and the family had not told the doctors during the lifetime of the patient.

Dr. E. L. Benjamin, Evanston: It is a pleasure to hear Dr. Bucy's excellent presentation on this subject. Careful studies to ascertain changes in the vascular walls are important in understanding the pathogenesis of subdural hematomas. Dr. Kirshbaum has brought up the question of intradural hematomas. The late Dr. Jaffee considered the splitting of the dura to form intradural hematomas.

I would like to ask Dr. Bucy whether he thinks the hypertension was caused by subdural hemorrhage, and what is the relation of hyperthermia to subdural hematomas.

Dr. Edwin F. Hirsch, Chicago: I believe Dr. Bucy mentioned thrombosis of the cerebral veins and that the lesions in the brain were hemorrhagic. I would like to ask if hemorrhagic infarct is not a rather characteristic lesion with cerebral vein thrombosis.

Dr. Paul C. Bucy, Chicago (Closing): Dr. Kirshbaum has mentioned the possible relationship of alcoholism, and Dr. Bassoe that of syphilis to subdural hematoma. There are many who would deny that these conditions have any direct relationship to the condition. They recognize that a high percentage of the victims of subdural hematoma suffer also from one or both of these chronic conditions. They say, however, that the apparent relationship results from the fact that these people fall down and bump their heads more frequently than other people. Although I am not convinced by this simple explanation I do not know how to prove a more direct relationship.

Intradural hematomas, i.e., hemorrhage between the two layers of the dura mater, have not been discussed here. Many people apparently have been impressed with the occurrence of such hemorrhages. I have never seen one. That of course does not mean that they do not exist. I have looked carefully both at the operating table and at necropsy for such hematomas and none has been found. Accordingly I do not believe that such hematomas are commonly amongst those giving rise to clinical manifestations.

Dr. Benjamin, I do not know the cause for the hyperthermia which occurs in some of these cases.

Vascular hypertension has not been common amongst my cases and I do not believe that such hypertension is a common cause for subdural hematomas. There are of course no arteries or arterial branches in the subdural space which could bleed and cause this condition.

Dr. Hirsch has raised the question of the relationship of venous thrombosis to subdural hematomas. Dr. Hirsch is not talking about the usual cerebral thrombosis — apoplexy; but venous thrombosis. Thrombosis of the large dural sinuses and of the communicating veins commonly leads to hemorrhage both in the cerebral substance and into the subdural space. In most cases the intra-cerebral hemorrhage is the more important one. Recently, however, Dr. F. J. Lesemann and I have reported a case in which the subdural hematoma resulting from venous thrombosis was the most important feature of the case. (J.A.M.A. 1942, Vol. 119, pp 402-405). In that instance evacuation of the subdural hematoma relieved the patient of his cerebral symptoms.

THE RASCALS

My patients suffer tragic woe
And weep and wail and almost die,
But when my back is turned I know
They laugh a little on the sly!

DIFFERENTIAL DIAGNOSIS AND SURGICAL CARE OF JAUNDICED PATIENTS

CHARLES B. PUESTOW, M.D.
CHICAGO

Most careful clinical and laboratory studies and the best of medical judgment often do not enable one to distinguish medical or hepatogenous jaundice from the surgical or obstructive form. This is true especially when the patient is not seen until jaundice has been present for many weeks or months. As patients with hepatogenous jaundice often react badly to surgery, whereas the obstructive form of jaundice can be relieved only by surgery, it is imperative that every possible aid be employed to establish a diagnosis. The most important of these are clinical experience and judgment. Fortunately, jaundice rarely if ever is a surgical emergency and delay in operating permits both more accurate diagnosis and better preparation for surgery.

Theoretically, we should be able to distinguish between these two general types of jaundice by liver function tests and in the very early stages of jaundice, one often is able to do so. In hepatogenous jaundice there is primary damage of the liver cell and all of its functions may be diminished. Because of the tremendous reserve power of the liver and the wide latitude of normal readings in some functional tests, a considerable degree of liver damage is necessary to be manifested by abnormal readings. Other tests, however, will indicate very moderate cell pathology. Later the liver cell often partially recovers from its initial injury and although jaundice may increase or persist, some of the functional tests will return to normal.

Obstructive jaundice in its early stages causes little damage to the hepatic cell. We would, therefore, expect its functions to be normal and to note alterations only in the quantity of products of liver activity which are regurgitated into the blood stream. This is true for a short time after the onset of obstruction but due to back pressure upon the liver cells, alterations of their circulation and perhaps toxic influences, functional impairment gradually ensues and many of the laboratory tests may give results simulating intrahepatic jaundice.

Certain factors in the history and physical examination as well as laboratory studies help us to distinguish between various forms of jaundice although such findings are not sufficiently constant to be infallible. I would like to review the evidences of hepatogenous jaundice and of the three most common causes of obstructive jaundice, namely; biliary calculus, stricture of the bile ducts, and malignancy of the pancreas or ampulla of Vater. Each type will be illustrated by a patient presenting some typical and some atypical symptoms.

Hepatogenous Jaundice. The symptoms presented by patients with toxic or infectious intrahepatic jaundice vary somewhat with the cause of the disease. The infectious forms, such as catarrhal jaundice, usually run a febrile course with associated malaise and debility. The toxic forms often give a history which discloses the etiological factor, such as the ingestion of poisonous drugs or chemicals. These patients do not appear as acutely ill as those having the infectious type. Both present a gradually increasing jaundice without pain or pruritis. Although bile may disappear from the intestines for a short time in the early stages of the disease, it soon returns and is a constant finding thereafter. Examination may reveal the liver slightly enlarged and often tender. Depending upon the severity of damage to the liver, functional tests such as galactose tolerance, hippuric acid synthesis, bromsulphalein excretion, and blood protein levels, will reveal normal or reduced capacity and blood cholesterol may be normal or diminished. If this form of jaundice persists for weeks or months in a chronic form, certain changes occur. The patient may recover from his malaise and feel well enough to carry on normal activities. The amount of bile in the stool may increase or remain constant, that in the urine is likely to diminish. The skin may become more brawny in color and pruritis occasionally will develop. The liver loses its tenderness but remains enlarged and firm and the spleen frequently becomes palpable. Liver function tests more definitely indicate progressive damage to the hepatic cell. When a patient is seen for the first time at this stage, it often is

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difficult to distinguish hepatocellular jaundice from certain of the obstructive forms, especially those due to "silent" calculi. As the disease progresses, liver insufficiency with ascites, weakness, and emaciation ensues.

The patient illustrating this form of jaundice began to have biliary colics and dyspepsia in 1920 when she was forty years of age. These symptoms persisted until 1930 when her gallbladder which contained stones was removed. She was comparatively symptom free for eight years when a painless jaundice was noted eighteen months before she came under our care. During this time she was afebrile, her weight was constant, appetite good, and she was able to do her work. The jaundice varied in intensity but never disappeared entirely. No severe pain occurred but she noted an aching in the liver. She also had frequent generalized abdominal cramps, often with loose stools. In the later months of her jaundice, she noted occasional but never marked itching. Her urine was constantly dark and the stools were light but were never free of bile. Liver function tests showed some evidence of cell damage, especially indicated by the retention of bromsulphalein.

This patient was suspected of having a hepatogenous form of jaundice. However, certain factors in her record were not typical and an obstructive jaundice possibly due to a silent stone cound not be ruled out. The history of a previous operation for stones in the gallbladder, the intermittent aching in the liver, the fluctuation in degree of jaundice, all could be associated with stone. After adequate preparation, the patient was explored and an advanced cirrhosis of the liver with normal bile ducts was found. The enlarged spleen was removed and the omentum transplanted to minimize the vascular load.

One year after this operation there was little change in her clinical condition and she still was able to do her work but the ultimate prognosis of course is not good.

Obstructive Jaundice. When obstruction to the extrahepatic bile ducts occurs, certain findings are constant irrespective of the nature of the lesion while other symptoms and signs will vary, depending largely upon the completeness of the obstruction and the presence or absence of infection. Mechanical obstruction of the ducts does not produce much change in the functional capacity of the hepatic cell and most liver function tests will reveal no change except for regurgitation products in the blood until secondary liver damage results.

Biliary calculi producing obstruction are diagnosed largely by their history. Long-standing biliary dyspepsia commonly precedes the onset or recurrence of jaundice. The degree of icterus varies greatly and it entirely disappears between attacks in most instances. Some bile usually is present in the stools but varies in amount inversely to the degree of jaundice. Pruritis frequently but not always is associated. Fever may or may not be present depending upon the existence of infection. The liver and spleen rarely are palpable but tenderness below the liver may exist. If such attacks are allowed to persist for weeks or months, definite liver damage will ensue and can be detected by laboratory tests. In from five to ten per cent of patients with obstruction due to stone, the jaundice may be constant and pain may be absent. When such patients are seen late and the liver has been damaged it may be difficult to distinguish their disease from hepatogenous jaundice.

The following patient illustrates this: A white female, fifty years of age, entered the hospital with a history of being well and free from pain or dyspepsia until two years ago. At that time she developed a generalized papular eruption over her entire body with associated pruritis, weakness, and progressive weight loss in spite of a good appetite. These symptoms continued without change until nine months ago when she developed a painless jaundice. The jaundice gradually increased and the stools which at first were very light in color later became and remained somewhat darker. She had no qualitative food distress and her only abdominal discomfort consisted of a sense of epigastric fullness relieved by vomiting. The vomitus frequently contained bile. At the time of admission to the hospital she had lost forty-five pounds in weight, was deeply jaundiced, and appeared weak and debilitated. Her skin was brawny in color and showed excoriations from scratching and also a diffuse papular eruption. The liver extended about one finger's breadth below the costal margin but was not tender. Bile was

Figure 1 — Roentgenogram after barium meal. Arrow indicates stone in common bile duct.

present in the stools and in the urine and urobilinogen was approximately normal in quantity. In studying liver function, the galactose tolerance test, hippuric acid excretion, serum protein levels, serum amylase, and prothrombin time were all within normal limits. The bromsulphalein test however, showed a fifty per cent dye retention at the end of thirty minutes. Blood cholesterol was elevated to seven hundred milligrams with sixty-one per cent free cholesterol. During three weeks of observation and conservative treatment, there was little change in the patient's condition or in her laboratory findings. The icterus index varied between forty and sixty units and was fairly constant. Bile persisted in the stools. A flat X-ray plate of the abdomen revealed ring shadows in the region of the gallbladder and also one in conjunction with the duodenum which we thought might be in the common bile duct (Figure 1). The patient was operated and a gallstone found impacted in the ampulla of Vater. It was removed through a transduodenal incision. The gallbladder which contained stones also was removed and a T-tube placed in the common duct. The patient recovered uneventfully although her jaundice was slow to disappear. At the time of dismissal from the hospital two weeks after operation, the icterus index had fallen to thirty, total cholesterol had dropped to 325 milligrams, and her bromsulphalein still showed a forty per cent retention of dye at the end of thirty minutes. Within the following thirty days her jaundice greatly diminished.

This patient's history, in a number of ways, is atypical for obstructive jaundice due to calculi. The persistent jaundice with only a slight degree of fluctuation, and the absence of pain and biliary dyspepsia are infrequent in this disease. Factors suggestive of an obstructive type of jaundice were; the presence of a marked pruritis, X-ray evidence of calucli in the bile ducts, normal findings in many liver function tests, and an increase in blood cholesterol.

Stricture of the common duct producing jaundice, fortunately is quite rare. As this condition almost invariably follows previous surgery upon the biliary tract, a history of such an operation will be obtained. Because infection in the bile ducts usually accompanies stricture of the choledochus, the patient will give a history of chills and fever. The degree of jaundice may vary in intensity but rarely returns to normal. Bile constantly is present in the duodenum and in the stool. Right upper quadrant pain of a generalized aching type or occasionally sharp in character may occur and be followed by increase in jaundice with elevation of fever and a diminution of bile in the intestine. The liver may become slightly enlarged and tender. Liver damage progresses more rapidly in this form of obstructive jaundice than in those in which infection is unassociated. This is manifested in the liver function tests. The disease usually is progressive and presents a difficult surgical problem often with unsatisfactory results.

The patient used to illustrate obstruction due to stone later presented an atypical history of stricture. For three months following her previous operation she remained free of jaundice and improved in general health. The T-tube was not removed because of the prolonged jaundice and liver damage. However, the tube was clamped. About six weeks ago this patient again became jaundiced. The jaundice increased steadily and was associated with pruritis. Cholangiograms revealed a marked stenosis but not complete occlusion of the distal end of the choledochus where the calculus had been imbedded (Figure 2). Although the T-tube was unclamped, drainage from it evidently was inadequate as was indicated by the persistence of her jaundice. Upon re-operating this patient

Figure 2 — Choledochogram. Arrow indicates point of stricture. Some opaque medium has been forced into the duoednum under pressure.

the distal end of the common duct was found to be strictured, evidently produced by extensive fibrosis following ulceration of the mucosa caused by the long impaction of the gallstone. An anastomosis was made between the common duct and the duodenum and the patient has recovered.

This patient's story is atypical for stricture in that she had no chills or fever or other evidences of associated infection.

Malignant lesions producing obstructive jaundice most frequently are located in the head of the pancreas but are not uncommon in the ampulla of Vater or bile ducts. The majority of these lesions produce symptoms which make the diagnosis apparent. The onset of jaundice is painless and progresses to its maximum in a fairly steady curve with little fluctuation. Pruritis almost invariably is present. A preceding history of biliary pain or indigestion is uncommon and symptoms of indigestion developing after the obstruction has occurred and indefinite in character. As infection rarely is associated with the obstruction, fever is uncommon. Examination of the patient reveals a gradually enlarging liver beneath the edge of which the distended gallbladder may be palpated. As obstruction usually is complete, bile will be absent from the duodenum and stools but will be present in the urine. Urobilinogen will be absent or diminished in the urine. In the early stages of obstruction, liver function tests will be within normal limits except for an increase of regurgitated products such as cholesterol and bile pigment in the blood. Little damage to the hepatic cell can be demonstrated by these tests even after a number of weeks or months of total obstruction.

The following case record illustrates an unusual history for this type of obstruction. Four months before a fifty-five year old white male was admitted to the hospital, he began to have attacks of vomiting. About a month later he developed what he thought was an attack of influenza with cough, thoracic pain, headaches, and malaise. He was bedridden for one week. Three weeks later he noted a gradually increasing painless jaundice. Nausea, anorexia, and some vomiting accompanied it and these symptoms persisted until the time of his hospitalization. He stated that his jaundice varied in intensity. During the first month of hospitalization jaundice persisted but fluctuated in degree and he was free of pain and pruritis. He ran a febrile course, his temperature reaching 102° to 103° each afternoon. The leucocyte count varied from 20,000 to 30,000 and remained elevated throughout this time. Bile was present in the stools upon repeated examination. The icterus index varied between thirty and forty units. The liver gradually enlarged, the edge extending two to three fingers below the costal margin. With these symptoms we concluded that we were dealing with an intrahepatic form of jaundice. At the end of the first month, the clinical pictures remained quite uniform except that the stools became clay colored and were free of bile. The icterus index increased to sixty units and there was a gradual development of slight pruritis. The febrile course continued and occasional chills were manifested. During the following six weeks the patient was

studied carefully in an effort to determine the nature of his jaundice. Occasionally, the degree of jaundice diminished and a slight amount of bile was found in the stools. At other times bile again became absent from the stools and there was an associated increase in jaundice. A secondary anemia developed which was combated by transfusions. At the end of the eleventh week, there appeared to be a slight improvement and it was decided to operate this patient. Exploration revealed a carcinoma of the head of the pancreas completely obstructing the common bile duct. No other pathological condition was found. A cholecystogastrostomy was performed following which the temperature subsided to normal and remained there. The jaundice rapidly cleared and he was dismissed from the hospital on the fifteenth postoperative day.

This patient presents an unusual history for obstructive jaundice due to carcinoma of the head of the pancreas. The febrile course throughout his illness, the absence of pruritis, the variation in intensity of his jaundice, and the intermittent appearance of bile in the stools are not common findings for this lesion.

DISCUSSION

Differentiation between the so-called medical and surgical forms of jaundice is often a difficult diagnostic problem. When the symptoms and findings are typical for a given lesion, the diagnosis can be made without difficulty. Too frequently, however, atypical findings obscure the picture and necessitate the use of every possible diagnostic aid. No single or group of criteria can give a definite differential diagnosis. This is true especially in jaundice of long-standing. A careful history of the disease, a thorough physical examination, frequent use of the laboratory, and daily evaluation of symptoms are necessary to determine the best form of therapy. Fortunately, jaundice is not a surgical emergency. Most patients react poorly to surgery when they are operated in the first few days of an increasing jaundice. There is considerable difference of opinion as to the most opportune time to operate upon jaundiced patients. Where the diagnosis is definite and the condition is a surgical one, operative therapy may be instituted if the patient has been properly prepared. Even under these circumstances, it is perhaps well to follow the dictum of not operating upon a patient who presents an increasing jaundice. Most obstructions due to stone will subside and permit the patient to become a better surgical risk. If the obstruction is complete, the degree of jaundice will increase to a maximum and remain there. The patient then can withstand surgery better than during the period of increasing jaundice.

Liver function tests are of greater value in determining the ability of a patient to withstand surgery than they are in establishing a differential diagnosis. When surgery is decided upon, every precaution should be taken to protect the damaged liver. The important functions of the liver relative to carbohydrate and protein metabolism must be protected by the ample administration of foods containing these elements. A restricted ingestion of fats is important. Additional vitamins should be administered to insure an adequate reserve. Proper fluid balance must be maintained. Although liver function tests can give us some information as to the various functions of the liver, it is well to consider all jaundiced patients as having a damaged liver and fortify it as much as possible. The use of vitamin K and bile salts gives added protection against hemorrhage. Where secondary anemia exists, blood transfusions should be given. Adequate postoperative protection of the liver must be maintained because of the increased damage resulting from the operative procedure itself. By such care of patients, it is safe to delay surgery for a number of weeks until one is thoroughly convinced that surgical treatment is indicated. Prolonged study, if combined with proper therapy for the protection of the liver, often will preclude surgery upon patients suffering with intrahepatic jaundice and rarely will jeopardize the future health of a patient whose jaundice is of obstructive origin.

AFTER THE DETAIL MAN HAS LEFT:

If you feel old
And worn and cold
Hormones are just the ticket
They make you strong
And ogle long
And cheerful as a cricket!

THE HEALTH ASPECTS INVOLVED IN FUEL RATIONING EXPLAINED

Abstract Of Report Medical, Public Health And Ventilating Expert Submitted To Government Is Published In Journal

Some of the medical and public health considerations involved in the recent announcement of the rationing of heating oil in thirty states and the District of Columbia are explained in the October 3 issue of *The Journal of the American Medical Association.* The article is an abstract of a report on the health aspects of fuel rationing as worked out by medical, public health and ventilating experts and submitted to the Advisory Committee, Fuel Rationing Division, U. S. Office of Price Administration, by a subcommittee headed by Leverett D. Bristol, M.D., Dr.P.H., New York. *The Journal* abstract says:

"Physicians, engineers and public health workers are accustomed to think of indoor heating and ventilation in terms of a 'comfort' zone. We may have to reorganize peacetime procedures in the direction of a 'discomfort' zone. Health should not be jeopardized; any rationing plan adopted should be based on equality for all, with special consideration for those of tender or advanced age, or those with actual disease or lowered vitality. Any plan must be preceded and followed through by an intelligent and extensive educational program directed by some federal agency in Washington, with whatever medical or public health assistance or leadership may be required. Centralized medical or public health advisory relationships will be of great help with state and local groups as well as at the federal level. A suggested slogan based on a popular song of the first world war is 'Keep the Home Fires Burning — *Low!*'

"In the past we have erred on the side of too high temperatures and too dry atmospheres. Temperatures must be kept down, but we must not err at the other extreme so that severe chilling and possible sickness may result. While most of our winter ills are due to bacterial and virus infections, scientific evidence shows the important relationship of lowered resistances and changes of weather to these conditions. There is little experimental evidence to show what an individual in a wartime economy can get along without in his artificial heat requirements without injury to health.

"Ventilation is not so much a matter of what we breathe in through our lungs as it is of how our skin and body react. It is more of a cutaneous [skin] than a respiratory problem. It is more immediately important to ventilate in the interest of the heat regulating mechanism of the body.

"An ideal temperature, irrespective of humidity and air motion, does not exist, nor does a safe minimum temperature exist without these influencing factors."

The report says that, without regard to other factors, the following may be considered minimum temperatures for emergency requirements for fuel oil rationing: for the average private home and apartment house, department stores, office buildings, and so on, 60-68 F. (majority opinion 65 F.), subject to local regulations or codes; for hospitals and sanatoriums, 68-80 F. (majority opinion 70 F. except operating rooms 80 F.), for schools, 60-70 F. (majority opinion 65 F.), subject to local regulations or codes.

"Indoor temperatures of dwelling places, hospitals, schools, stores and offices," *The Journal* abstract continues, "must vary according to the conditions and activities of occupants and the specific uses to which various rooms are put. All industries should carefully scrutinize their heating and ventilating equipment and practices to the end that winter indoor heating temperatures may be kept at the lowest possible point consistent with the efficiency of the workers. . . .

"Little or no attempt should be made to heat bedrooms, except those occupied by infants, aged persons or those who are ill. Bedroom temperatures may be from 50 to 60 F. The bathroom should be kept warm and a schedule set up for dressing and undressing in the bathroom. Warm night clothes and bed coverings should be provided. Living rooms should be kept at a suitable temperature at the expense of the dining room, halls and kitchen. The temperature should be lowered to 50 F. at night and local heat sources should be utilized. Drafts from windows, doors and fireplaces should be minimized by keeping windows and doors closed. Pulling down window shades at night screens the cold blast from the rest of the room.

"Reduced indoor temperature is less apt to injure persons in good physical condition and

having good health habits. The usual recommendations relative to exercise, sunlight, food and rest are stressed. Adequate clothing, and especially foot covering, is emphasized. Cold baths of short duration are recommended for certain persons. Overfatigue should be avoided.

"Indoor comfort and health depend on individual adjustments of clothing as much as on proper heating and ventilation. Double comfort standards between men and women are due largely to differences in dress or clothing. The application of this knowledge to individual situations would do much to prevent dissatisfaction and possible ill effects of cooler indoor temperatures and drafts during the winter. Every individual should be brought to realize that he is his own clothing engineer and that a heavier dress or suit, an extra undergarment or overgarment may do much toward winter health and comfort in overcool rooms. 'Wear a sweater and help win the war!' The body adjusts itself readily to temperatures at least 10 degrees below what we in the United States consider the standard temperatures for dwelling houses. The English, based on experience with radiant heat, believe that a 60 F. dry bulb temperature is adequate if room occupants are properly clothed. . . .

"Supplemental fuel oil should be allowed to homes in which there are children under 4 years of age, for whom a temperature of not less than 70 F. should be provided. This would also take care of the needs of the nursing mother. After the fourth birthday, normal children need a cooler and not a warmer environment than adults. Older people, particularly those of lowered vitality, should have a temperature of not less than 70 and possibly as much as 74 F. Consideration should be given to individual differences; some people are 'old' at 55, others are 'young' at 70. In general, supplemental rations should be made available for homes with 1 or more occupants over 65. Where there are 1 or more cases of acute or chronic illness or invalidism, the physician should be the judge of the need for supplementary fuel oil rations.

"The physician's place in administration and certification would consist in certifying to the ration board for the supplemental fuel oil rations for cases involving actual needs arising out of sickness and the infirmities of old age or other special cases. It might be desirable to have a local physician as a consultant or adviser to local ration boards. Consideration should be given to possible periods of abnormally cold weather and the possible occurrence of epidemics or threatened epidemics of disease and to communities which may accurately be described as health resorts."

Commenting on the report, *The Journal* says that on another page of this issue there "appears a statement relative to the health aspects of fuel rationing and a brief summary of the coupon rationing plan announced by the Office of War Production in a press release. The possibility that about three million homes and apartments in thirty states on the Eastern Seaboard and in the Middle West may have to be kept at reduced temperatures in the coming winter owing to a shortage of heating oil is of interest to physicians. Warmth may be required in certain circumstances for reasons of health, and physicians may be called on under the proposed regulations to certify to the necessity for supplemental oil allowances. Families in which there are 1 or more children under 4, 1 or more persons aged 65 or older and 1 or more cases of illness, convalescent persons, persons with low vitality or persons in circumstances which require the maintenance of a higher degree of room temperature than the temperatures now recommended may wish physicians to issue certificates. In the presence of a dearth of scientific information as to tolerable minimum temperatures, a medical advisory committee to the Office of Price Administration has been compelled to disregard the standard published recommendations for the comfort zone of heating and ventilation and to attempt to establish a safe zone at a lower temperature in which health could be considered adequately safeguarded and discomfort minimized. The Office of Price Administration has tentatively accepted the recommendations of the committee as set forth elsewhere in this issue. Local physicians may be called on by the local ration boards to act in an advisory and consulting capacity to the board. They may also be requested to certify to the necessity for supplemental fuel rations in excess of the standard allowance to meet the situations outlined."

Clinicopathologic Conferences

J. J. Moore, M.D., Department Editor.

PRESENTATION OF CASES BY
LOUIS LOEFFLER, M.D.

Decatur and Macon County Hospital
DECATUR

Case 1—DOUBLE LARGE INTESTINE

A widow, twenty-four years of age was admitted to the hospital March 3, 1940 with complaints of pain in the abdomen of several months duration and symptoms suggestive for mild intestinal obstruction. A large mass was felt in the left lower quadrant.

At operation a mass of adhesions was found in the left lower region with uterus and adnexae embedded and fixed to the sigmoid. A loose, strange looking piece of tissue, seen at operation was easily pulled out and peeled off the mesentery where it was loosely attached. There seemed to be no end to it, pulling and pulling disclosed a two finger thick tube-like organ about five to six feet long, both ends of which were connected with the large bowel, one end with the sigmoid, the other end with the colon somewhat above the cecum. There was almost no bleeding in removing this structure.

The connection with the sigmoid had to be severed by removing a portion of the sigmoid with which it was bound together with some adhesions to the uterus and adnexae. Soon after operation a peritonitis developed and the patient expired 14 days after opertion (3-25-40).

Pathological Report: The autopsy confirmed the general peritonitis and in addition revealed an extensive necrosis both of the cecum and sigmoid regions. Both these portions were entirely gone so that large empty spaces were seen and the open ends showed multiple perforations in a gangrenous bowel wall.

Several small thrombosed vessels in the neighborhood of cecum and sigmoid were embedded in adhesions and fresh pus. The rest of the large bowel and the entire small bowel and the mesentery appeared perfectly normal in their length and shape. There was nothing to suggest that a large portion of the bowel had previously been removed.

The other organs showed no significant pathology.

What the young lady in the picture (see Fig. 1) is holding in her hands represent 72 inches or 6 feet of a viscus organ; the width of the specimen is only 4 cms when opened, considerably less than a normal large intestine (see Fig. 2). Upon microscopic examination all three layers of bowel: mucosa, musculature and serosa are seen to be present (see Fig. 3).

We are dealing therefore with a double large intestine and with, I think, the first specimen ever seen of such a length. Because of the connections with ascending and descending colon as seen at operation this specimen can not be considered as a diverticulum.

DISCUSSION

Question: Anybody ever heard of such a thing?

Dr. Loeffler: There are several reports in the literature on the subject of double intestine the last and very good one comes from the Children's Hospital in Boston. However those specimens are double intestines of only short and normal length, from about the cecum to the sigmoid or mostly less than that.

Question: Have you had an x-ray taken?

CASE I

Figure 1 — Double intestine, 6 feet long, removed at operation.

Figure 2 — Showing the width of the double intestine. A piece of normal sigmoid at the right.

Figure 3 — Microscopically all three layers of intestine are present.

Dr. Loeffler: Sorry no x-ray was taken before operation.

Case 2 — CEREBRAL HEMORRHAGE IN PREGNANCY

Dr. Long: Patient Para I, 24 years, had whooping cough, measles, and scarlet fever when a child. For the last ten years her condition was excellent, only occasional cold and sore throat. Menstruation began at age of 14, 28 day type, 7 day flow, regular.

Patient was first seen in office for prenatal care June 12, 1941. Blood pressure was 110/70, and she was found to be in perfect condition. She visited the office again on the following dates:

7-16-41 B.P. 110/90
8- 7-41 B.P. 120/80
9- 4-41 B.P. 120/80 Feet swollen
10- 9-41 B.P. 120/80 Feet swollen
11- 6-41 B.P. 124/80 Feet slightly swollen

The morning of November 28, 1941 the patient complained to her husband of having a slight headache. She called him at noon at his work and talked to him. Her headache had gone and she felt all right. He called her at 3 o'clock in the afternoon. Her speech sounded thick, muddled, and incoherent. He went home and found her lying across the bed slightly comatose but she answered his questions. She was brought to the hospital at once.

Blood pressure was 140/90.

The patient never seemed to regain consciousness although she answered questions at times and showed some improvement.

Laboratory Data:
Urine essentially negative on three occasions.
Blood Count —
Hemoglobin 80%
Red cells 3,450,000
White cells 22,200
Polys 90%
Lymphs 8%
Monos 2%
Counts at 11-28-41 and 12-3-41 essentially the same.

Blood sugar: 87 mgs/100 cc (11-28-41)

N.P.N.: 24.5 mgs/100 cc (11-29-41)

Spinal fluid: 6 cells in cu mm. Globulin negative (11-30-41)

Patient went into labor with a blood pressure 142/90 and delivered a living male infant O.L.A. (12-4-41)

Following delivery her coma deepened and respirations on second post partum day became very labored. She developed a slight jerking of the right arm and right leg. Expired 12-6-41.

Dr. Loeffler: At post mortem examination a large hemorrhage in the left hemisphere around the stemganglia about 6 x 8 cms was found. The blood was partially liquid, partially clotted, dark red. The wall of the cavity was brown tinged.

The general aspect of the hemorrhage was such as is typically found in cases of hypertension in older people. Grossly and microscopically no tumor was found. There was no arteriosclerosis. The brain arteries were delicate corresponding to the age. The internal organs showed no significant pathology. The heart was normal.

We are dealing with a rather unusual case of cerebral hemorrhage during labor, without any anatomical bckground.

Dr. Long: I am very glad I got the permit for the post. It makes me feel better to see that nothing else could have been done for her.

Question: How old is the hemorrhage?

Dr. Loeffler: The history of the hemorrhage goes back about 8 days. The slight discolorization of the wall is in accordance with that.

Question: How is the child?

Dr. Long: The baby is well and doing fine.

Case 3 — MALIGNANT HYPERTENSION WITH ELECTROCARDIOGRAM OF CORONARY OCCLUSION

Dr. Goodyear: L. C., 20 years of age was always susceptible to colds, has had mumps and measles, no scarlet fever, was operated upon for ruptured appendix four years ago.

Known to have high blood pressure for two years, discovered on examination for life insurance which he passed. Two weeks ago onset of sinus trouble with frontal headache which later became general or occipital in type

His chief complaints for two months, are frequency and nocturia and lumbar backache; has had hematuria once and has lost 20 lbs.

Admitted to the hospital 11-21-41.

Tall, well nourished, weighing 178 lbs., coughing purulent bloody sputum, obviously sick.

Pulse 108, regular. Apex beat 2 cms to the left and below the nipple. B.P. 204/144.

Urine: Specific gravity between 1.010 and 1.014. (3 occasions)

Albumin 4+ Sugar — negative

Field full of red cells and clumped white cells.

P.S.P. excretion 19% in two hours.

Blood: Hgb 94%
Rbc 4,460,000
Leucocytes 13,600
Polys 59%

N.P.N. 101 mgs/100 (11-23-41) and over 300 mgs/100 cc (12-4-41) B.M.R. —5

Slight and irregular elevation of the temperature during stay in hospital. Uremia developed and he expired 12-6-41.

Clinical Diagnosis: Malignant Hypertension, Nephrosclerosis, Uremia.

Dr. Loeffler: Anatomical Diagnosis:

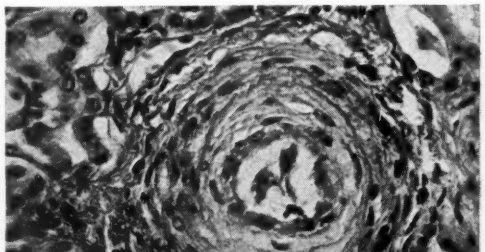
Enlarged heart, weighing 700 grams.

Slight smooth atrophy of the kidneys (140 grams each).

Passive Congestion — Bronchopneumonia.

Microscopically: Kidneys: There is a slight fibrosis of the cortex with the glomeruli and tubuli practically intact.

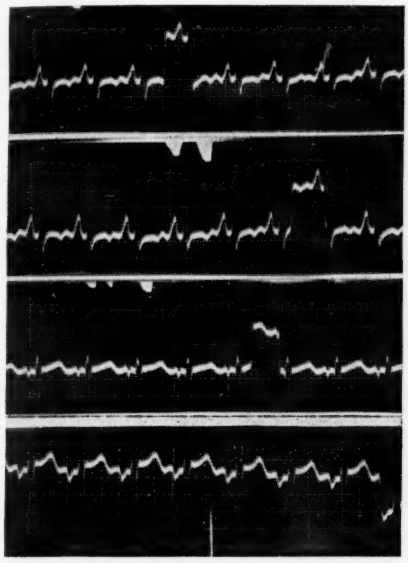
There is an extreme narrowing of the smaller arteries and arterioles, while the larger intrarenal arteries and the finest branches are rather



Case 3, Figure 4 — An example of the narrowing of the arterioles of the kidneys in malignant hypertension.

intact. The lumina are nearly occluded by edematous fibrous tissue, with the elastic fibers but slightly multiplied (see Fig. 4).

There is no definite necrosis of the small arteries, but there are some areas with pycnotic nuclei and disorganization of the arterial wall at some places. The other organs show no changes of the arterioles.



Case 3, Figure 5 — Electrocardiogram in malignant hypertension with uremia, resembling the coronary type.

The clinical as well as the anatomical findings are typical enough to call this case one of malignant hypertension.

Very interesting is the electrocardiogram (see Fig. 5). It is the main reason the case is presented and I would like to ask Dr. Rose to explain it shortly to us.

Dr. Rose: The electrocardiogram was taken 11-21-41 because the patient showed symptoms suggestive of coronary occlusion. The main findings are: The T waves are inverted in leads I and II. S-T segments are cove shaped in leads I and II. There is left axis deviation. A coronary type as this EKG represents does not necessarily mean a coronary occlusion. The post mortem findings showed the coronaries to be patent and not sclerosed. Thus this is a rather typical case of a coronary type of electrocardiogram found in a case of malignant hypertension with uremia.

It is worth while to mention this specifically, because it is not generally known although stressed in the literature.

Dr. Goodyear: I was most impressed by the narrowing of the arterioles of the kidneys so beautifully demonstrated here in kodachromes.

NERVOUS AND MENTAL EFFECTS OF SULFONAMIDE DRUGS

An admonishment that it is possible that the synthesis of new and more powerful derivatives of sulfanilamide will be brought to a standstill by the disappointing discovery that the more toxic or poisonous these drugs are to bacteria the more toxic they are to the human cell, is made by Sam C. Little, M.D., Ann Arbor, Michigan, in the *J.A.M.A.* for June 6.

Dr. Little says that it now is generally agreed that the mode of action of the sulfonamide drugs is bacteriostatic (inhibiting growth) and that it is not unlikely that many of the toxic effects are an integral part of the effect of the drugs on cells, whether bacterial or human.

"Animal experiments seem to indicate that all members of the sulfonamide group have a toxic effect on the nervous system, the parent substance, sulfanilamide, being the least toxic and some of the newer derivatives being the most toxic," he says. "A review of the clinical reports, in general, confirms the results of the animal experiments. The drugs appear to be more neurotoxic (poisonous to the nervous system) in the presence of pre-existing disease of the nervous system.

"The following abnormal conditions have been reported as due to the use of the sulfonamides: dysmorphosia (distorted vision), aphasia (loss of power of expression by speech, writing, or signs or of comprehending spoken or written language), agraphia (inability to express thoughts in writing), stammering, toxic psychosis, peripheral neuritis (inflammation of the nerves of the skin), encephalomyelitis (inflammation of the brain and spinal cord), myelitis (inflammation of bone marrow), optic neuritis (inflammation of the nerves of the eye), transitory myopia (nearsightedness), meningeal signs (of the membrane enveloping the brain and spinal cord), blindness, and convulsions."

. . . . "Education is the capturing of opportunity, and it is the miracle of opportunity that makes democracy. For opportunity can exist only to the degree that life about you — the law above you — the institutions around you — and the will within you — reflect the natural rights of man which within our own history have been written as life, liberty, and the pursuit of happiness. . . ."—*Governor McGrath, of Rhode Island, in a graduation address at Manhattan College.*

A bachelor is a man who has no children — to speak of.

News of the State

PERSONALS · COMING EVENTS · MARRIAGES · DEATHS

Dr. Loyal Davis, head of the surgical department of Northwestern University Medical School, Chicago, and editor of *Surgery, Gynecology* and *Obstetrics,* has been commissioned a lieutenant colonel in the U. S. Army Medical Department and assigned to duty as consultant in neurosurgery in the Surgeon General's Office, Washington, D. C. Dr. Davis served in the first world war and from 1922 to 1924 was associated with the late Dr. Harvey Cushing of Boston. He then came to Chicago as associate professor of surgery at Northwestern and in 1932 became head of the department of surgery.

Lieut. Wilbur G. Ball, USNR, of 1110 East Monroe St., Bloomington, Ill., has been named Medical Officer at the U.S. Naval Training School, for signalmen, University of Illinois, Urbana, Ill.

The new school, recently opened on the University campus, has accommodation for 800 men who will be chosen as the result of a series of aptitude tests given during their recruit training period. Following successful completion of this specialized course of training they will be sent to sea for duty with the fleet, or to a Naval shore station.

He is a member of County and State Medical Societies, the American Medical Association and the International College of Surgeons.

Charles Drueck, Jr. addressed the Marion County Medical Society on "The Vitamin Controversy," September 17.

Harry Leichenger gave a talk on Poliomyelitis before the McLean County Medical Society on September 8.

Dr. Ralph A. Kordenat of Chicago has been appointed vice chairman for Cook County for the Procurement and Assignment Service.

William D. McNally addressed the LaSalle County Medical Society, September 24th, on "The Physician and the Coroner's Office."

Norris J. Heckel addressed the Macon County Medical Society September 22nd on "Urology."

James H. Hutton has been invited to give an address at the Nurses Graduation exercises of the Cottage Hospital, Galesburg, on October 6.

A complete course on Electrocardiography Interpretation is being given in the educational program for interns and residents of Mercy Hospital. These lectures are given by George Hellmuth Wednesday at 6:00 P. M. and Saturday at 1:00 P. M. during September and October in the Library of Mercy Hospital. Any doctor that wishes to attend is cordially invited.

Frank L. Jenkins gave a health talk on September 3rd at Camp Lake, Wis., to the Officers attending the Third Annual Refresher Course of the Salvation Army. On September 8th, he addressed the older Officers at their first Seminar Session at Camp Lake.

The Department of Pathology of Cook County Hospital will resume Pathological Conferences beginning Thursday, October 1st. These conferences are in the morgue building between 11 A. M., and 12 noon.

COMING MEETINGS

The Post-Graduate Service Committee of the Illinois State Medical Society sponsored its first clinical conference of the year at Mt. Vernon, Illinois on Thursday, October 8th. The local doctors were hosts to all visiting physicians at luncheon and the program started at 1:30 with forty-five minute talks on

"The Minimum Requirement in Treatment of Fractures"

"Management of Burns"

"Recognition and Treatment of Shock"

"Treatment of Soft Tissue Injuries"

"The Oral, intravenous and intra-abdominal uses of sulfonamides"

Dinner was served at 6:00, followed by a talk on

"Procurement and Assignment" by Doctor Camp and a talk on

"Diseases to which Our Troops will be Exposed."

October 22 — POST GRADUATE CONFERENCE — Peoria — Banquet Room of the Hotel Jefferson. Program will start at 1:30 with forty-five minute papers on Burns, Fractures, Sulfonamides, Soft Tissue Injuries, Shock. Dinner at 6:30 followed by talks on "The Doctor Goes to War" and a talk on some subject in General Medicine. All physicians are invited to attend this Conference.

October 6 — Vermilion County Medical Society, Hotel Wolford, Danville — 6:30 P. M.

October 6 — Effingham County Medical Society — Benwood Hotel, Effingham — 6:30 P. M. — Darwin Kirby, M. D., "Emergency Surgery."

October 6 — Williamson County Medical Society — Herrin Hospital, Herrin — 8:00 P. M. — Hugh McCulloch, M. D. — "Newer Things in Pediatrics"

October 8 — Crawford County Medical Society — Woodworth Hotel — Robinson — 6:00 P. M.

October 8 — Post-Graduate Conference, Mt. Vernon

October 9 and every Friday — Will-Grundy County Medical Society — Louis Joliet Hotel, Joliet — 12:15 noon

October 12 — Hancock County Medical Society — Court House, Carthage 8:00 P. M. — R. F. Herndon, M. D. — "Physiological and Pathological Aspects of Nephritis"

October 13 — Adams County Medical Society —Lincoln Douglas Hotel, Quincy — 8:15 P. M. — F. E. Senear, "Eczema and External Irritants"

October 15 — Tri-County Medical Society — Kewanee — 4:00 P. M. — two papers on gynecology, dinner, speaker on x-ray and radium therapy in gynecology

October 20 — Macon County Medical Society — 6:30 P. M. — Decatur

November 3 — Vermilion County Medical Society — Danville — 6:30

November 5 — Southern Illinois Medical Society

November 10 — Adams County Medical Society — Lincoln Douglas Hotel Quincy — 8:15 P. M. — R. W. McNealy — "Gall Bladder Disease"

November 12 — Crawford County Medical Society — Robinson — 6:30

DEATHS

WILLIAM A. CAMPBELL, Chicago; Toronto University College of Physicians and Surgeons, Ontario, 1892. Head examiner of the Chicago office of the Mutual Benefit Life Insurance Company for 30 years. Died of a heart attack on August 31, 1942, aged 71 years.

ARTHUR FRANCIS DALY, Chicago; Loyola University School of Medicine, 1922. Died September 13, 1942 at the age of 46 years.

OLIVER C. DAVIS, Joliet; Chicago Homeopathic Medical College, 1882. Died August 22, 1942 at the age of 85 years.

GUY D. DOREMUS, Peoria, Ill.; Curtis Physio-Medical Institute, Marion, Ind., 1894; aged 76; died, June 14, of carcinoma of the pancreas.

MONROE GARRISON, Chicago; Loyola University School of Medicine, 1933. Clinical associate in orthopedic Surgery at Rush Medical College, on staff of St. Mary's, American and Little Company of Mary Hospitals. Died September 17, 1942 at the age of 34.

ARCHIE T. GIBSON, Morrisonville; Barnes Medical College, St. Louis, Missouri, 1896. Practiced in Morrisonville for 46 years. Died September 9, 1942 at the age of 69.

CLINTON H. GILMER, Villa Grove; Kentucky School of Medicine, 1888. Died August 31, 1942 at the age of 76 years.

ERNEST A. GREEN, Grayville; Barnes Medical College, St. Louis, Missouri, 1898. Retired for several years. Died August 29, 1942 at the age of 70 years.

EDGAR E. KILBY, Mackinaw; College of Physicians and surgeons, Keokuk, 1896. Died August 17, 1942 at the age of 71 years.

LOUIS C. LITTLEJOHN, Oconee; Medical College of Ohio, Cincinnati, 1885. Practiced in Oconee for 50 years. Died August 27, 1942 at the age of 84.

WALTER LOUIS MIGELY, Naperville; Northwestern University Medical School, 1910. President of the Board of Health at Naperville. He was former president of the DuPage County Medical Society and former president of DuPage County Tuberculosis Association. He had practiced in Naperville for 30 years. Died September 13, 1942 at the age of 58 years.

FREDERICK R. MUELLER, Chicago; University of Vienna, Austria, 1896. He was professor emeritus at Loyola University School of Medicine; on the staff of Columbus Hospital. He died September 10, 1942 at the age of 71.

KNUT WALDEMAR PAULSON, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1908; aged 73; died, July 6, in the Lutheran Deaconess Hospital of cerebral hemorrhage.

HUGO V. PRIBYL, Chicago; Rush Medical College, 1899. On staff of Jackson Park Hospital. Died September 20, 1942 at the age of 72 years.

STEPHEN WALTER RANSON, Chicago; Rush Medical College, 1907. Professor in neurology and Director of the Institute of Neurology at Northwestern University Medical School. Author of textbook "The Anatomy of the Nervous System" and contributor to scientific journals and a member of the editorial board of the Archives of Neurology and Psychiatry. Died August 30, 1942 at the age of 62.

ALBERT A. ROTH, Chicago; University of Illinois College of Physicians and Surgeons, 1905. Member of the Chicago Board of Health for many years. Died August 27, 1942 at the age of 67 years.

EMILE D. ST. CYR, Chicago; Rush Medical College, 1888. Chicago physician for more than 55 years. Died August 25, 1942 at the age of 76 years.

IDA M. WOOLLEY, Ottawa, Ill.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1901; aged 77; died, July 20, of cerebral hemorrhage.

MARRIAGES

JOSEPH L. SPEZIA, Herrin, Ill., to Miss Eileen O'Keefe of Chicago in June.

INTER-AMERICAN PUBLICATION

The simultaneous publication of the June issue of *Annals of Surgery* in Philadelphia by the J. B. Lippincott Company and in Buenos Aires by the Guillermo Kraft Company was a new step toward the consolidation of medical interests here and in South America.

The *Annals of Surgery* is the oldest surgical journal in the English language. Its appearance in Spanish marks a high spot in the Lippincott Company's celebration of its sesquicentennial this year.

As the result of negotiations and with the assistance of the Coordinator of Inter-American Affairs, and Mr. Lewis Hanke, Director of the Hispanic Foundation, Guillermo Kraft Company, one of the oldest and most respected publishing firms in Buenos Aires, is translating the *Annals of Surgery* each month for South American physicians and surgeons.

The medical profession in this country has become increasingly aware of its obligations and responsibilities in South America. No better symbolic demonstration could be given of its sincere willingness to develop permanent intellectual fraternization between the surgeons of the two continents.—*N. Y. State Jour. of Med.*

WHICH SIDE OF THE QUESTION ARE YOU ON?

Should mothers be given medical advice by neighbors, newspapers, manufacturers and other meddlers, gratuitously,

OR

Should the problem of infant feeding be kept where it belongs — in the hands of the medical profession?

Mead Johnson & Company are and always have been definitely on the side of private medical practice, and this is one reason why we have refused to advertise "complete foods" which "simplify" infant feedings. The use of cow's milk, water and carbohydrate mixtures represents the one system of infant feeding that consistently, for three decades, has received universal pediatric recognition because it offers an adjustable formula for meeting the changing requirements of the individual baby as it progresses. Of all the carbohydrates available, no carbohydrate employed in this system of infant feeding enjoys so rich and enduring a background of authoritative clinical experience as Dextri-Maltose.

Under the traditional Mead Policy, we re-affirm the fundamental principle that "Babies supervised by physicians are better babies." We continue to be voluntarily committed to the same side of this important medical economic question — as you.